US009492037B2

(12) **United States Patent**
Kee et al.

(10) **Patent No.: US 9,492,037 B2**
(45) **Date of Patent: Nov. 15, 2016**

(54) **HYBRID ENCLOSURE SYSTEM**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1636 days.

(21) Appl. No.: **12/910,740**

(22) Filed: **Oct. 22, 2010**

(65) **Prior Publication Data**

US 2011/0094686 A1 Apr. 28, 2011

Related U.S. Application Data

(60) Provisional application No. 61/254,390, filed on Oct. 23, 2009.

(51) **Int. Cl.**

A47K 3/00	(2006.01)
A47K 3/30	(2006.01)
A47K 3/34	(2006.01)

(52) **U.S. Cl.**
CPC .. ***A47K 3/30*** (2013.01); ***A47K 3/34*** (2013.01)

(58) **Field of Classification Search**
CPC A47K 3/30; A47K 3/34; A47K 3/36; A47K 3/38
USPC 4/557, 558, 607, 608
See application file for complete search history.

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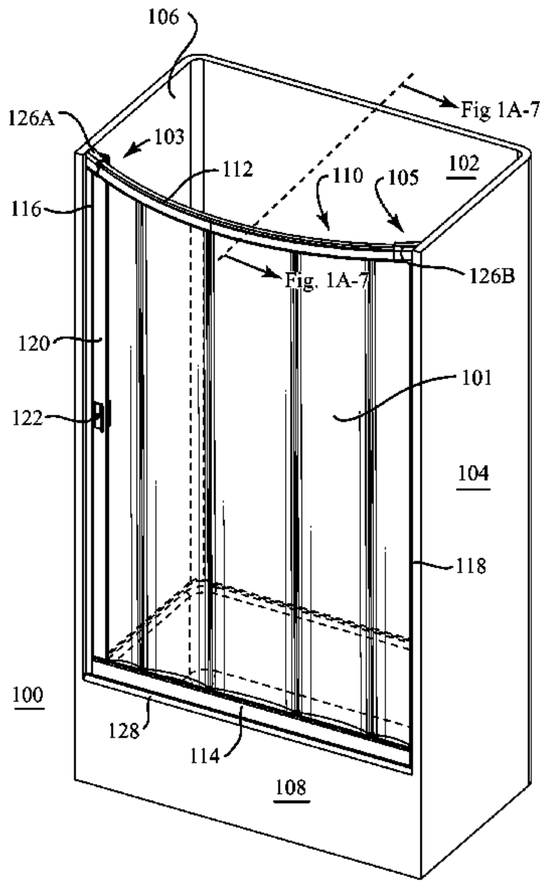
Primary Examiner — Huyen Le
(74) *Attorney, Agent, or Firm* — Patent Law Agency, LLC; Peter Ganjian

(57) **ABSTRACT**

A hybrid enclosure, comprising a flexible, lightweight cover coupled within a rigid frame and at least one rigid stile that functions to confine a space, with minimal structural encroachment into potential ingress and egress area of the space when fully open.

27 Claims, 57 Drawing Sheets



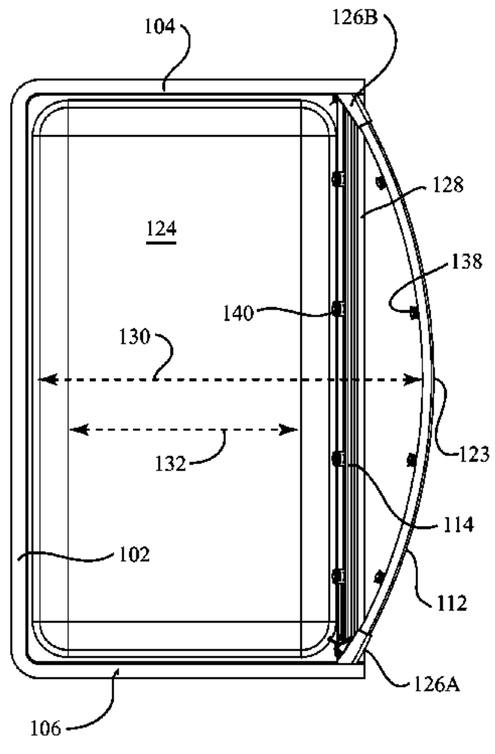


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Photo of broken hinge roller.
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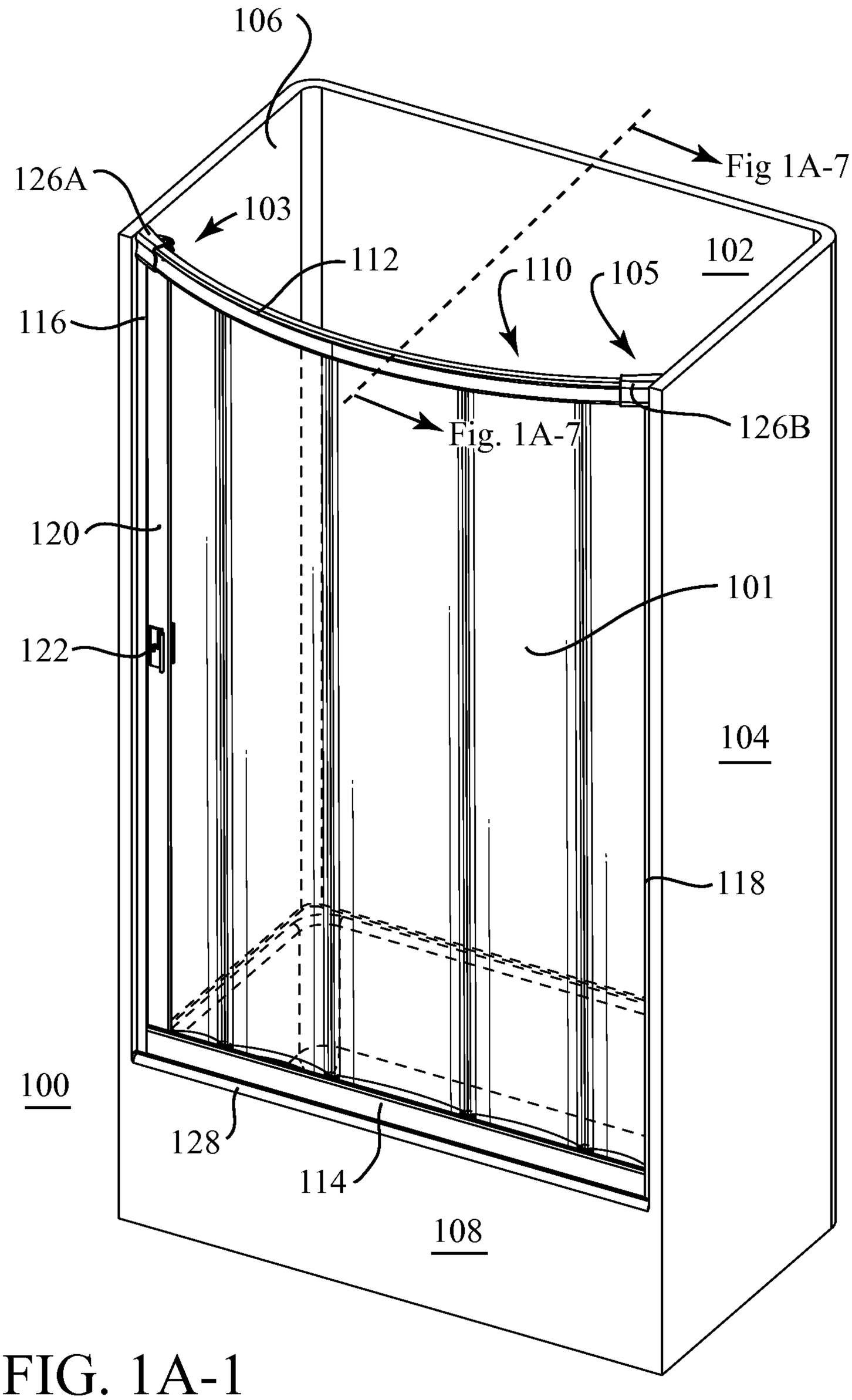
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Fig 1A-7
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Fig. 1A-7
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FIG. 1A-1

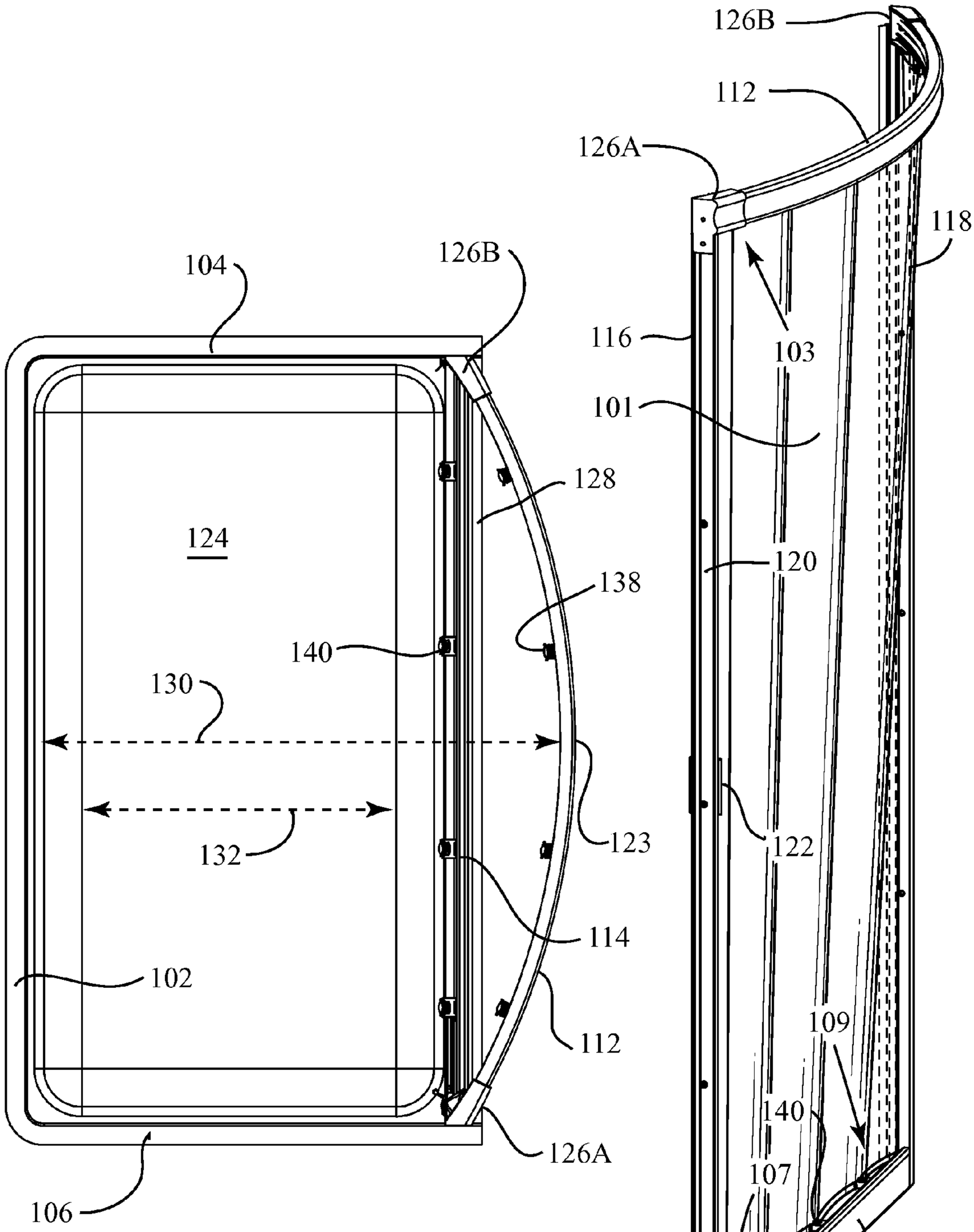

FIG. 1A-2

FIG. 1A-3

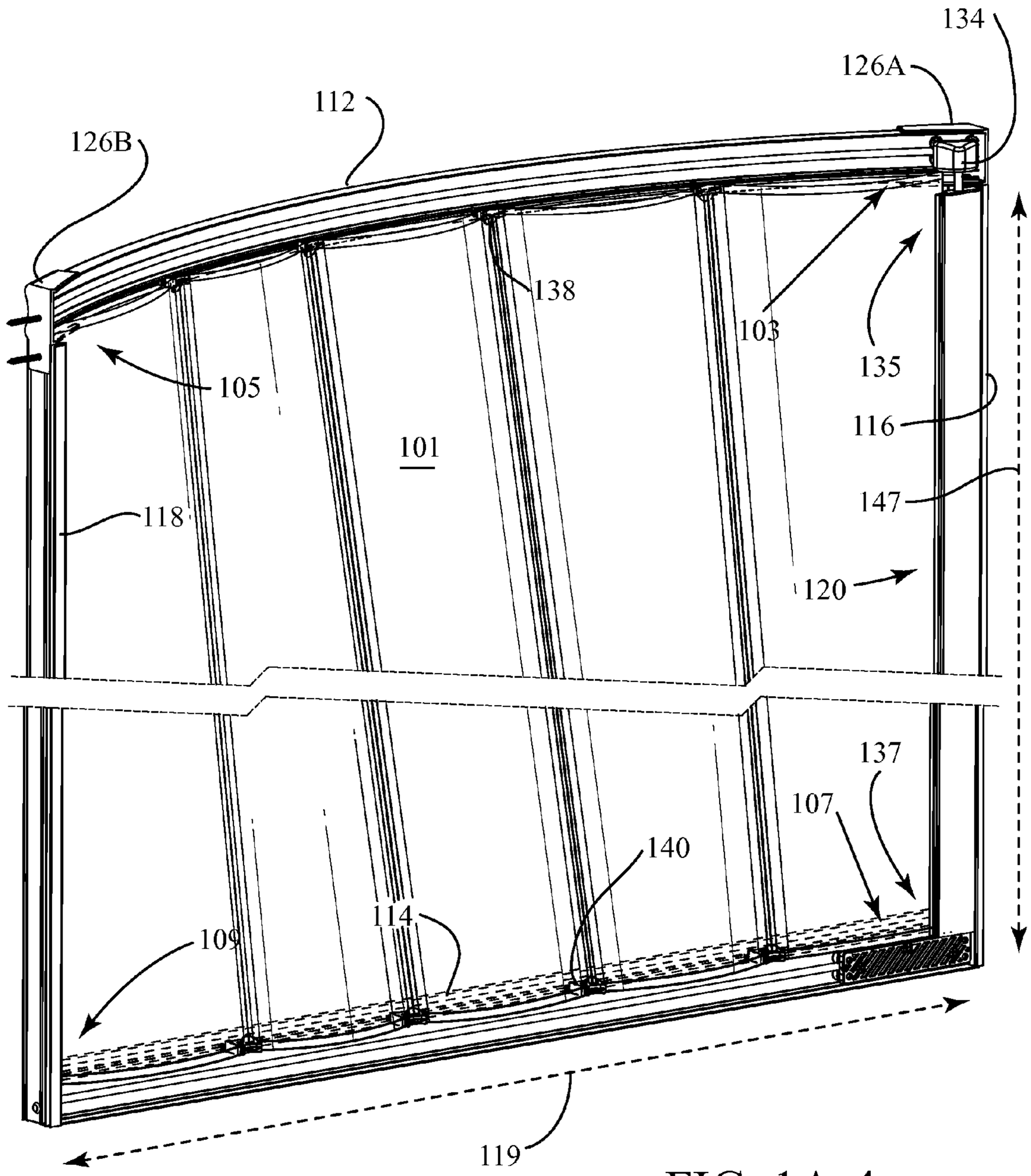
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FIG. 1A-4

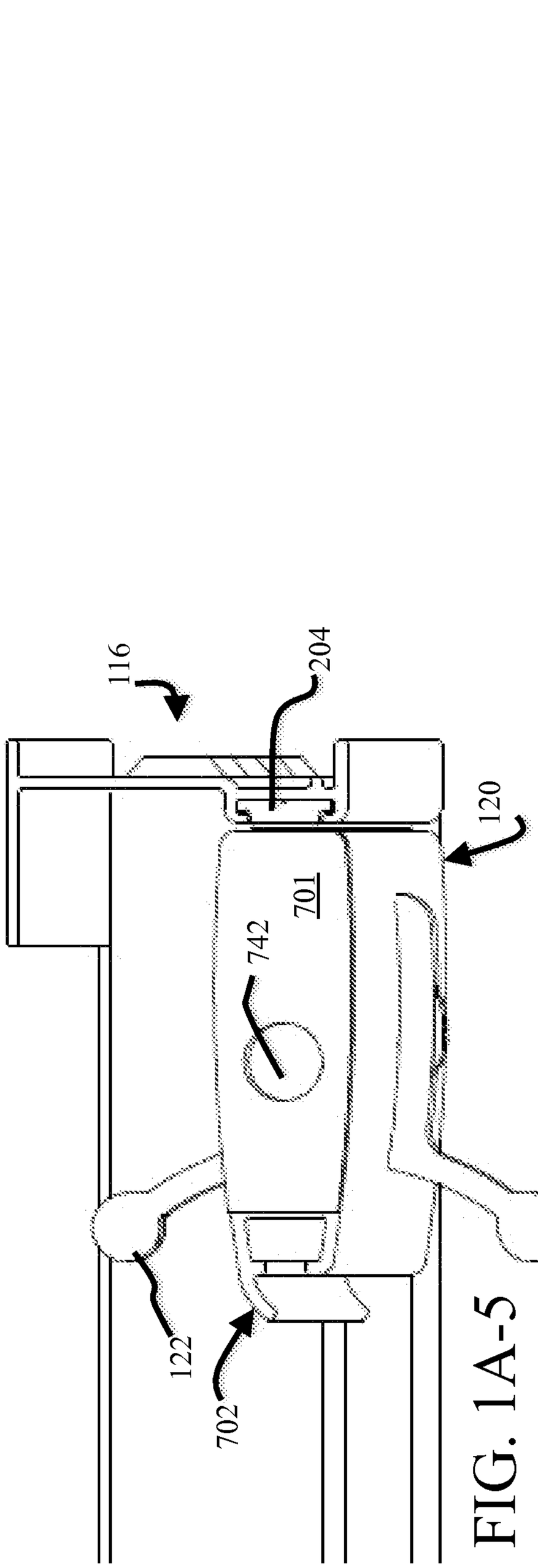
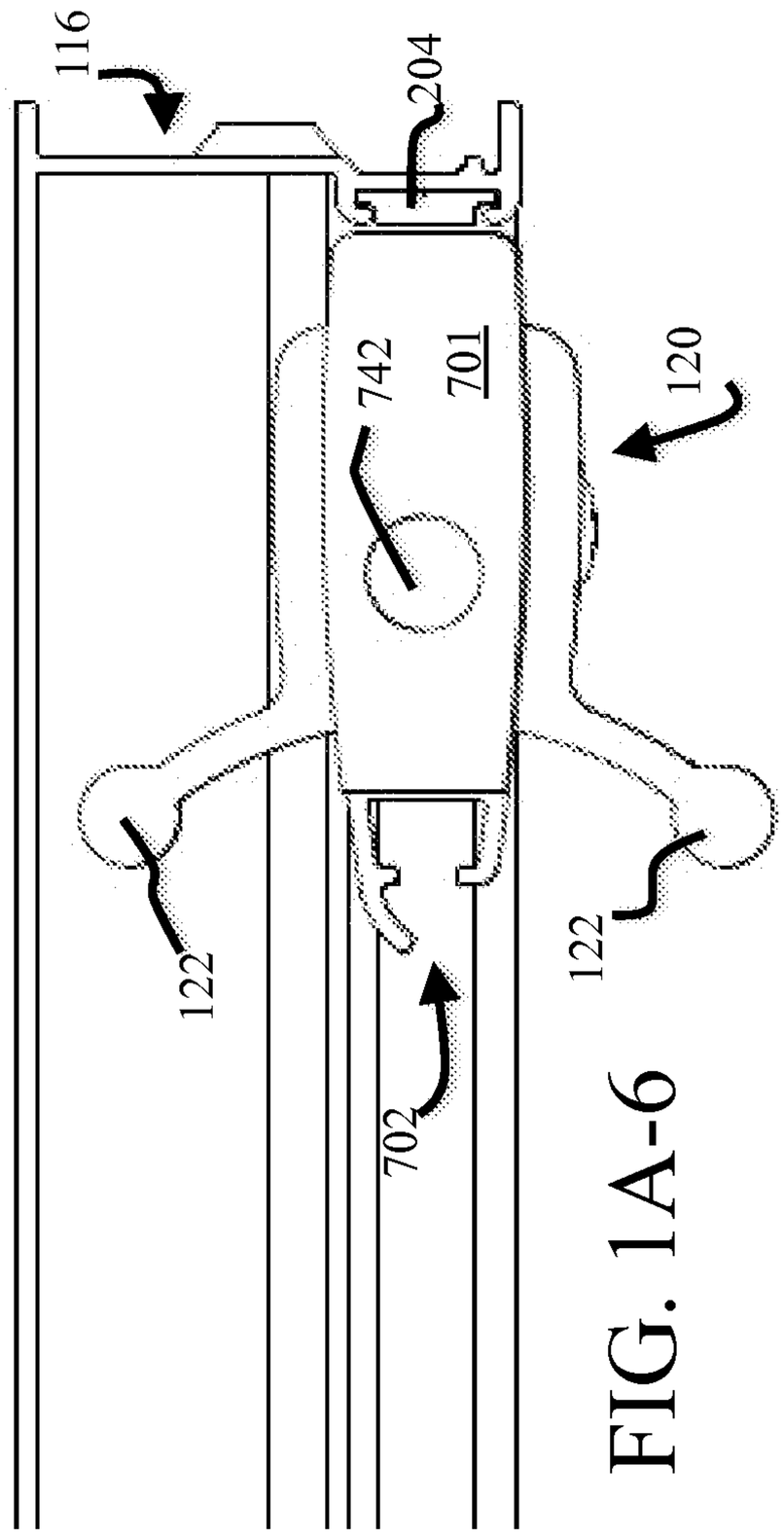


FIG. 1A-5



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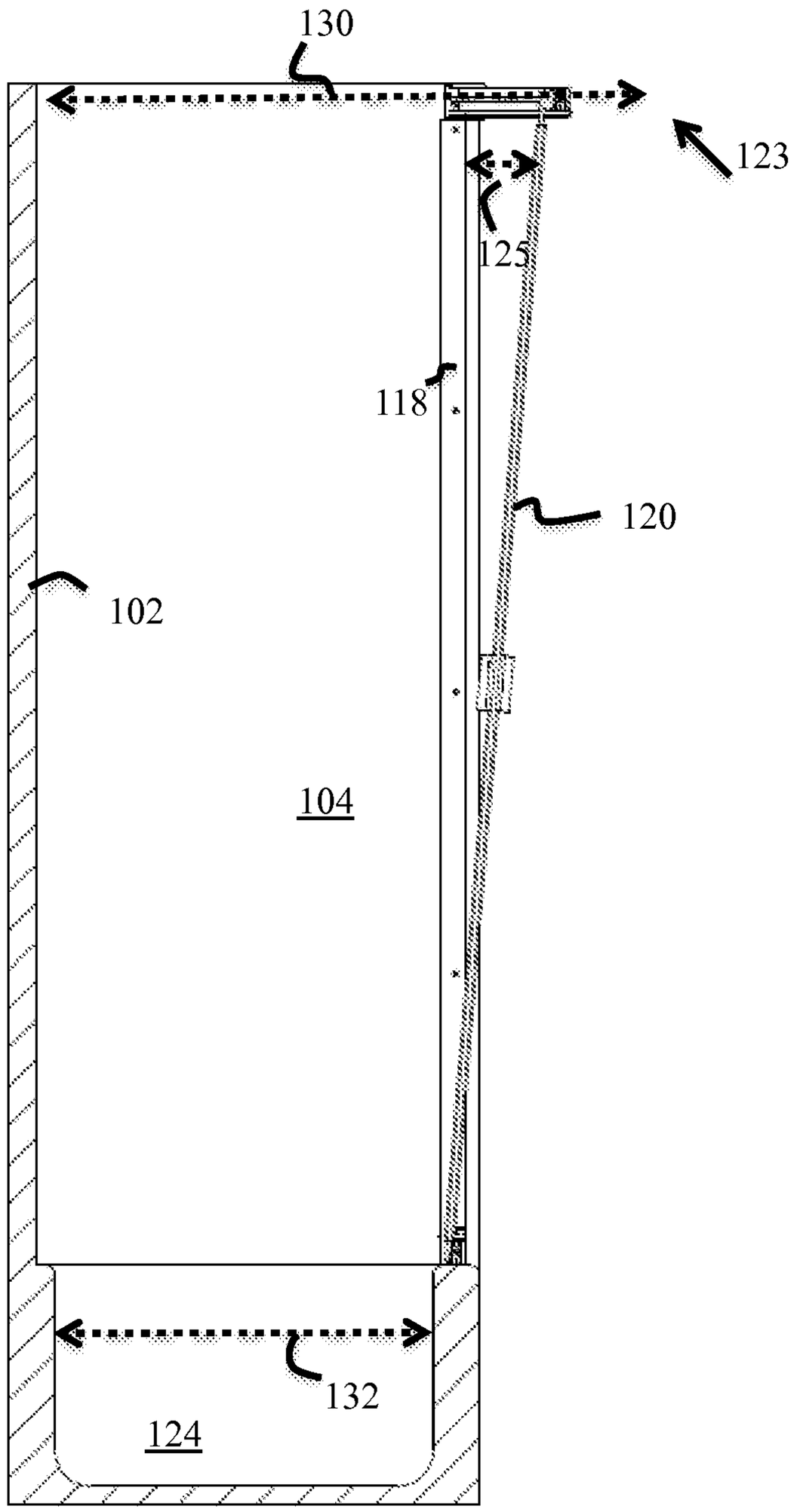

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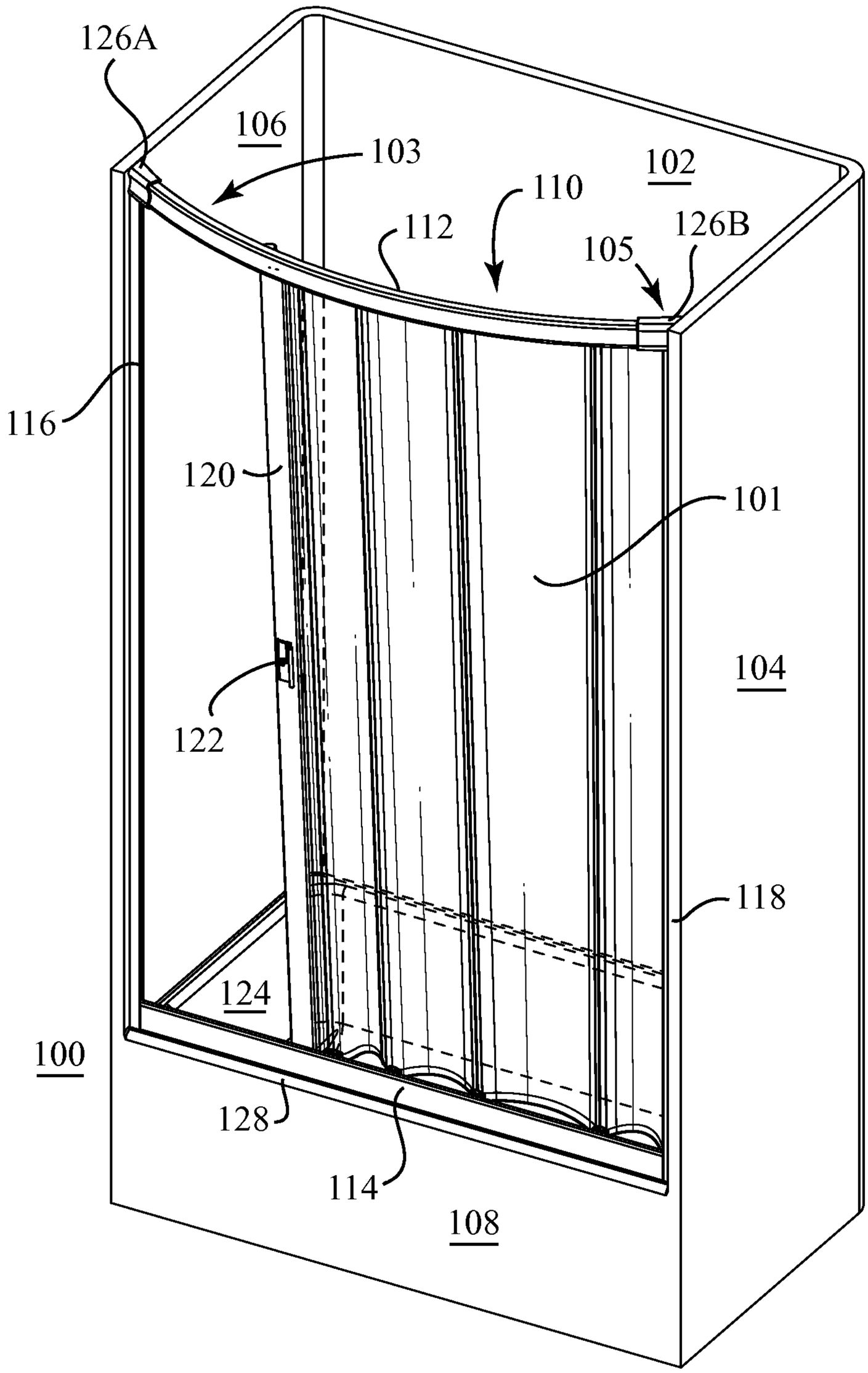
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FIG. 1B-1

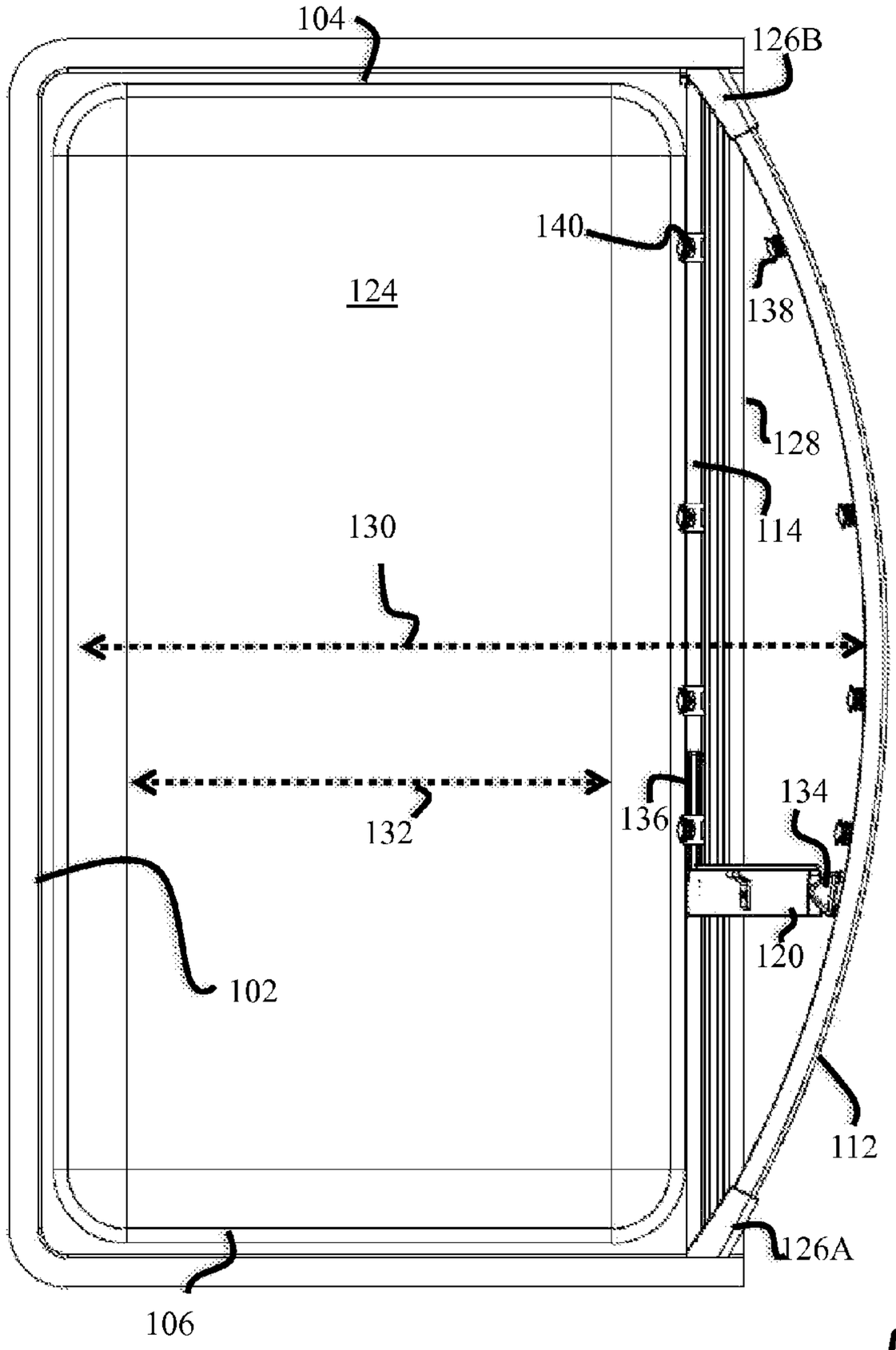

FIG. 1B-2

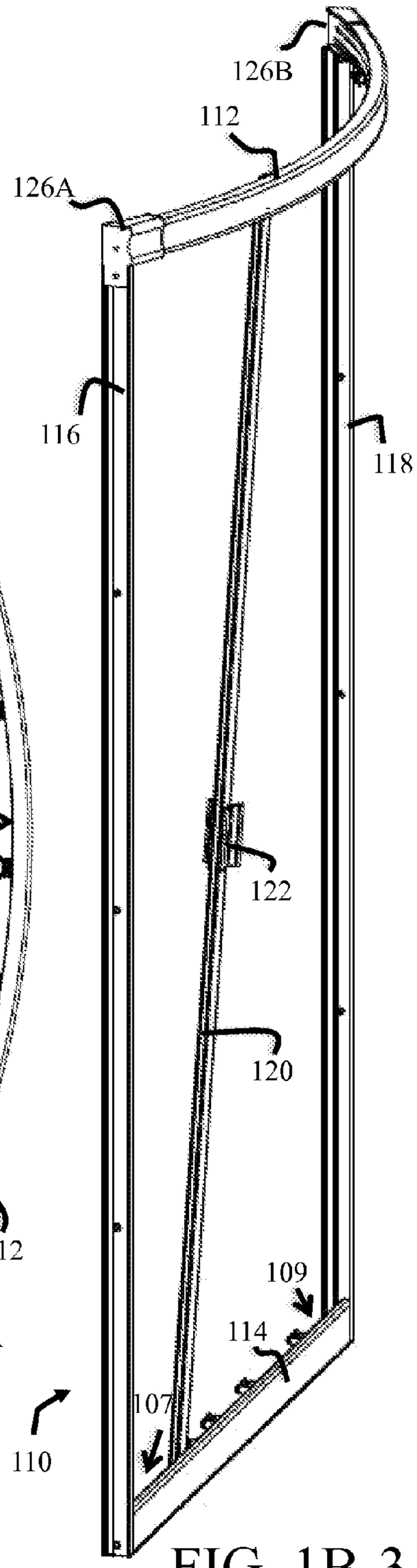

FIG. 1B-3

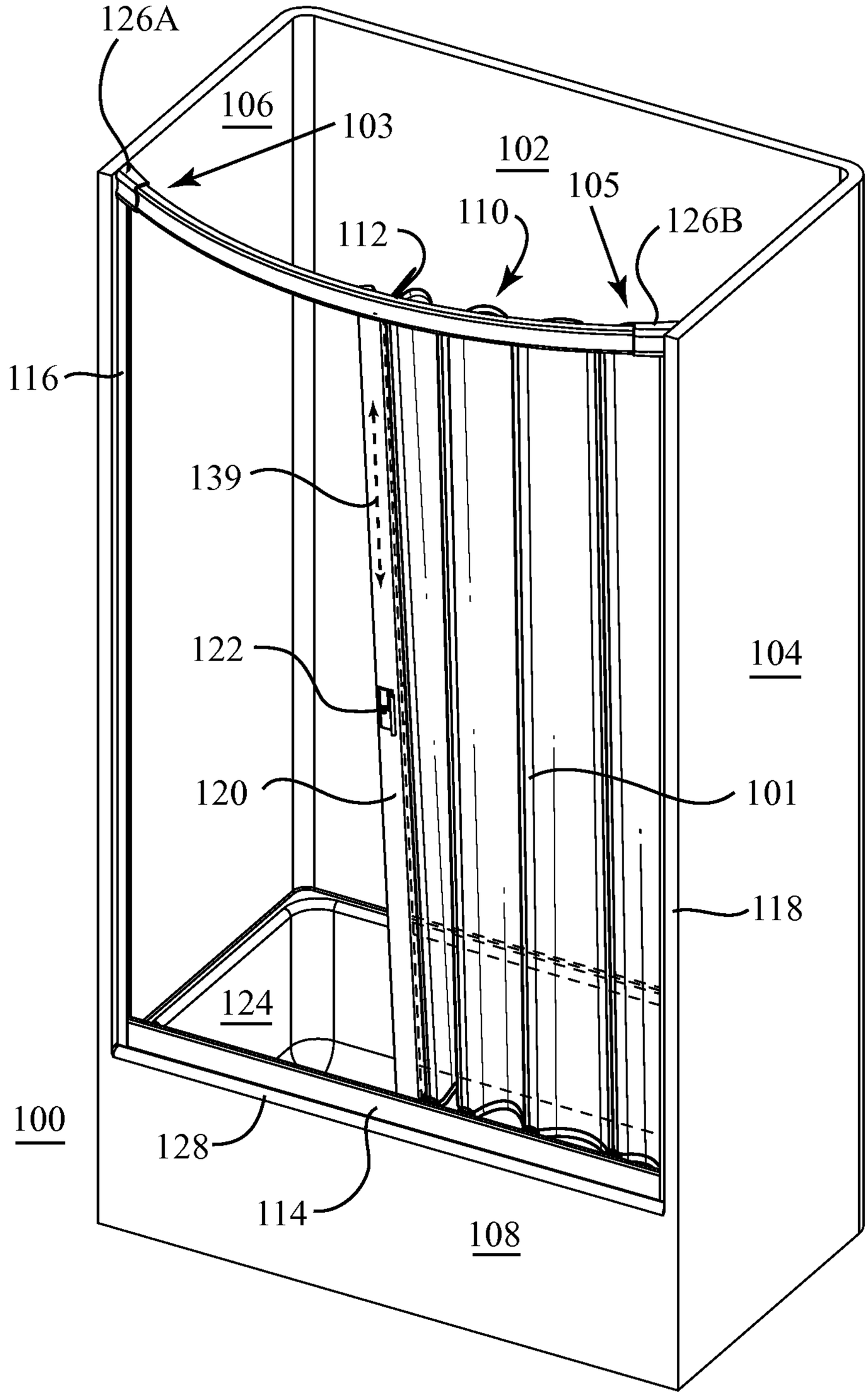
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FIG. 1C-1

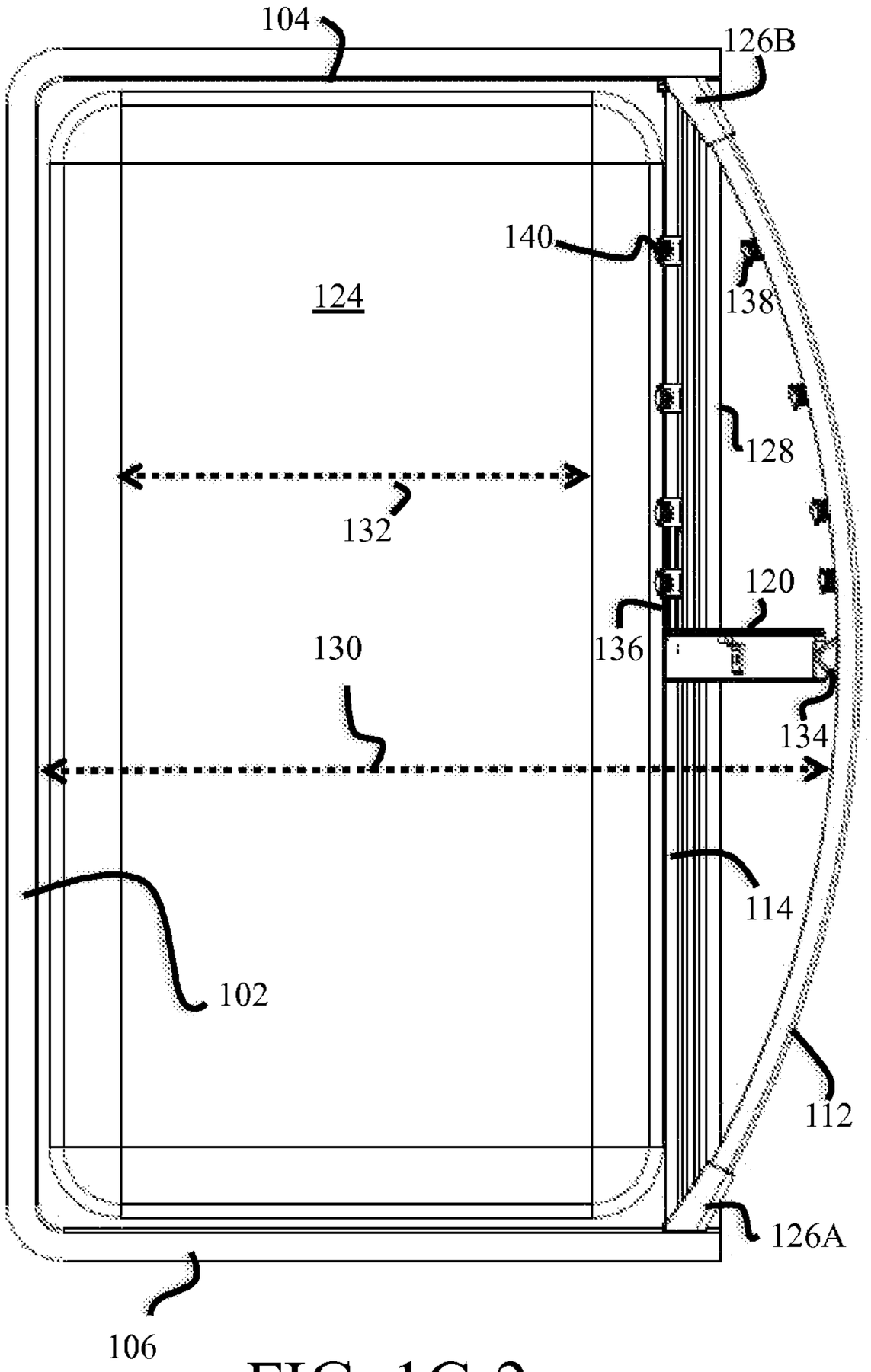

FIG. 1C-2

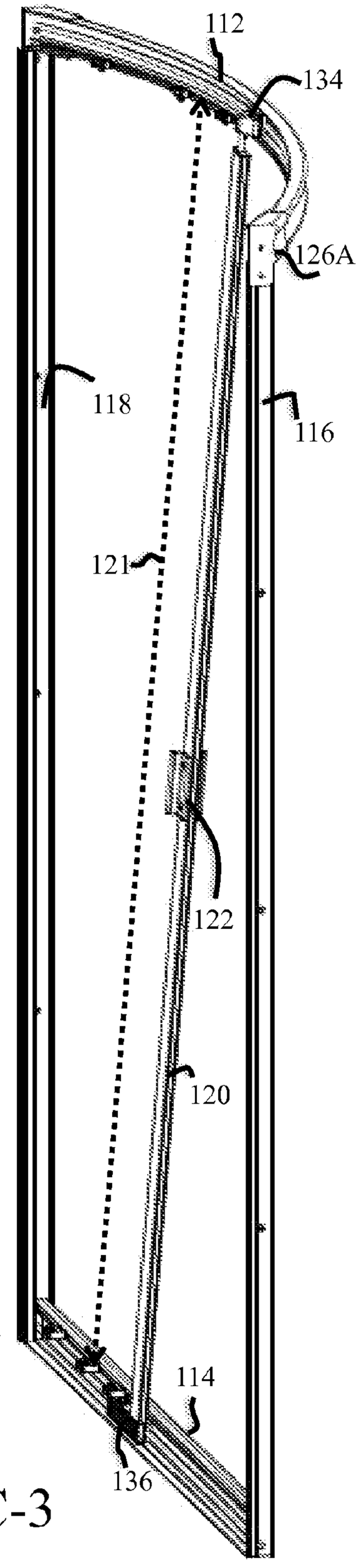

FIG. 1C-3

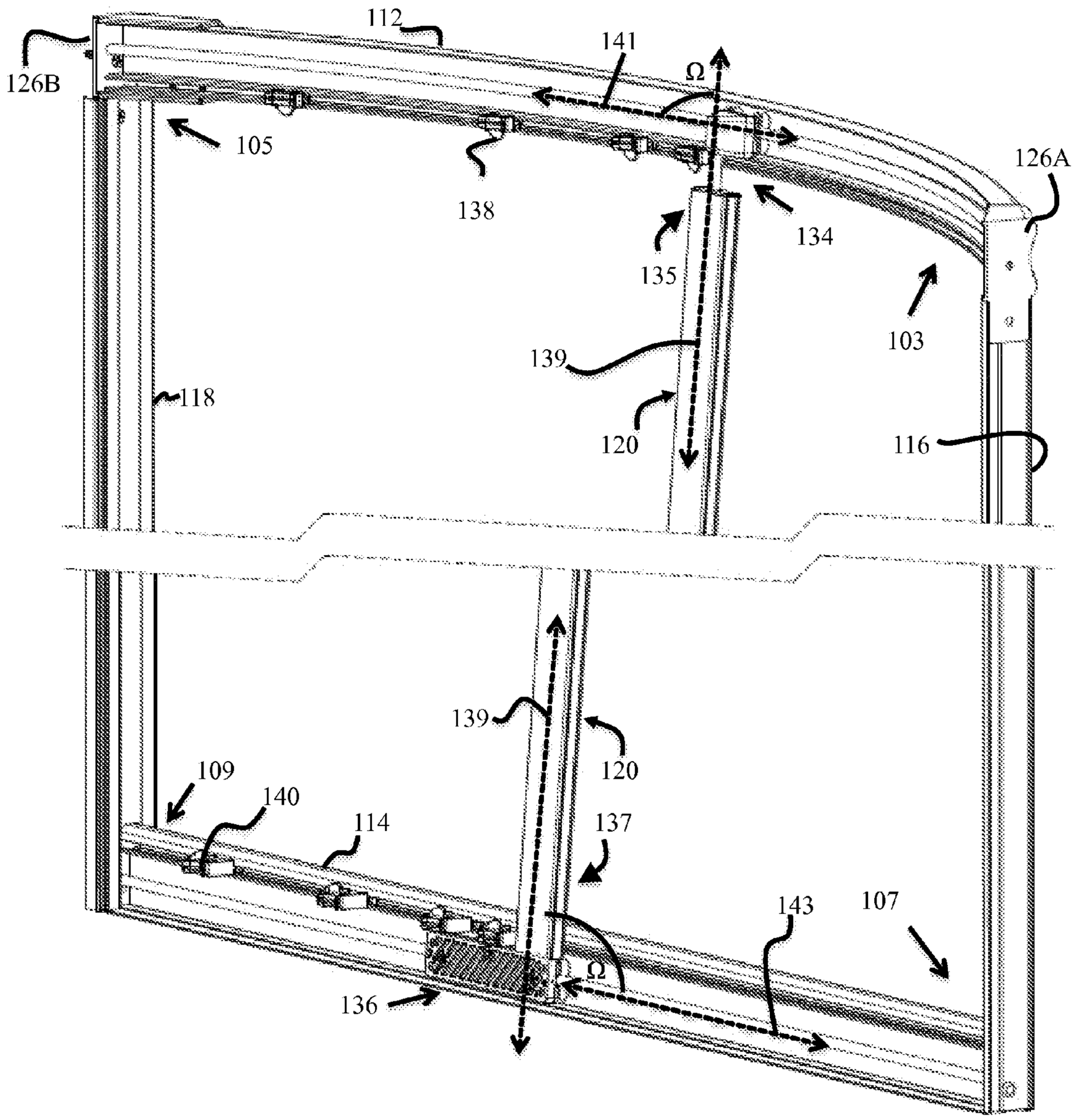
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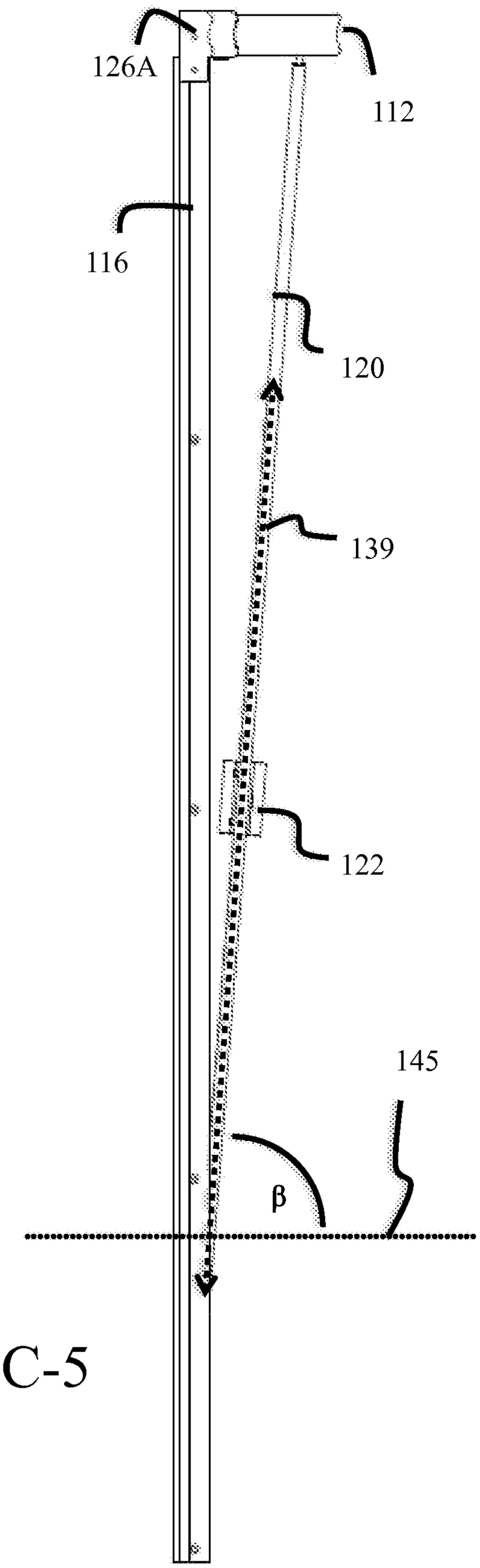
FIG. 1C-4



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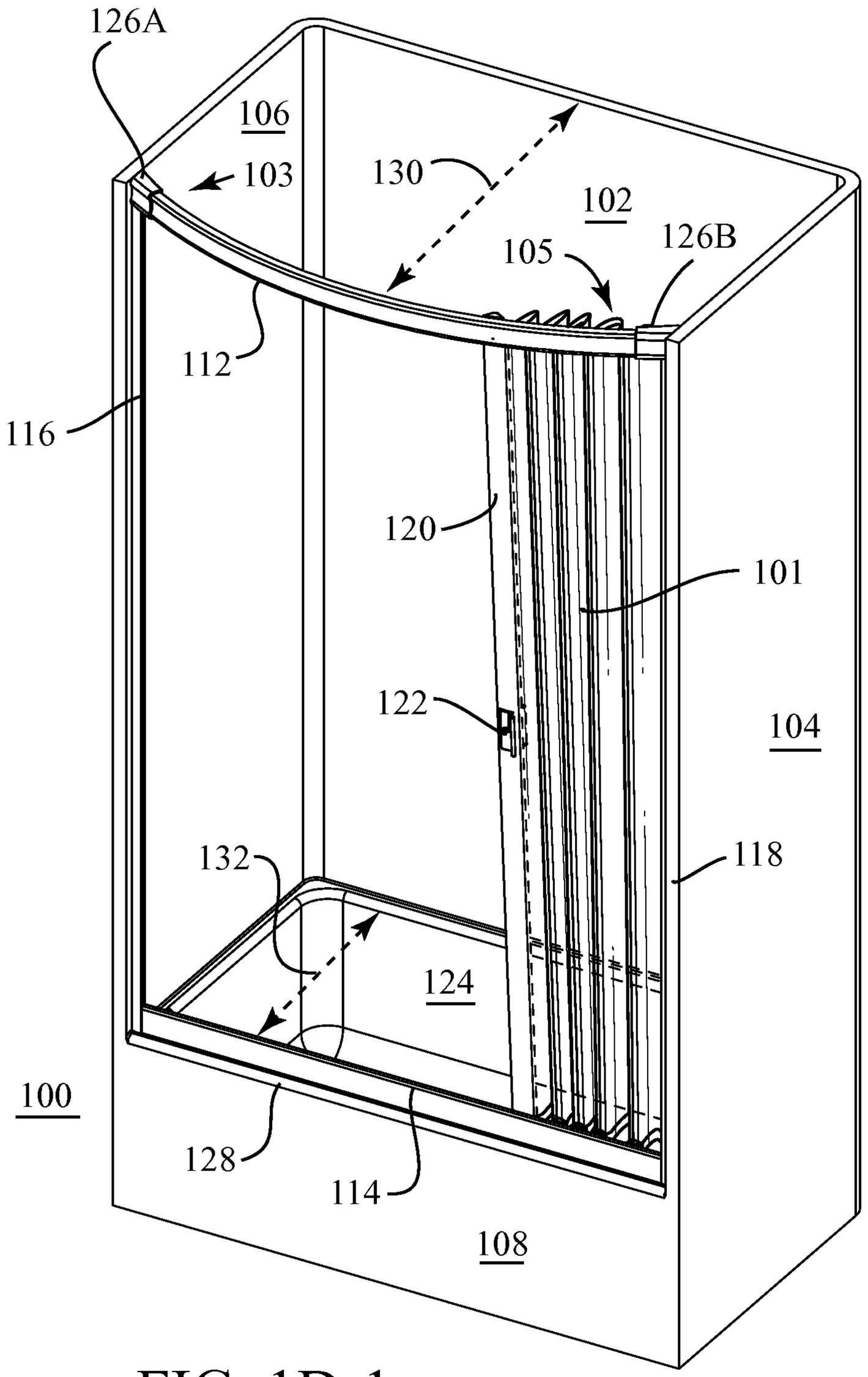
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FIG. 1D-1

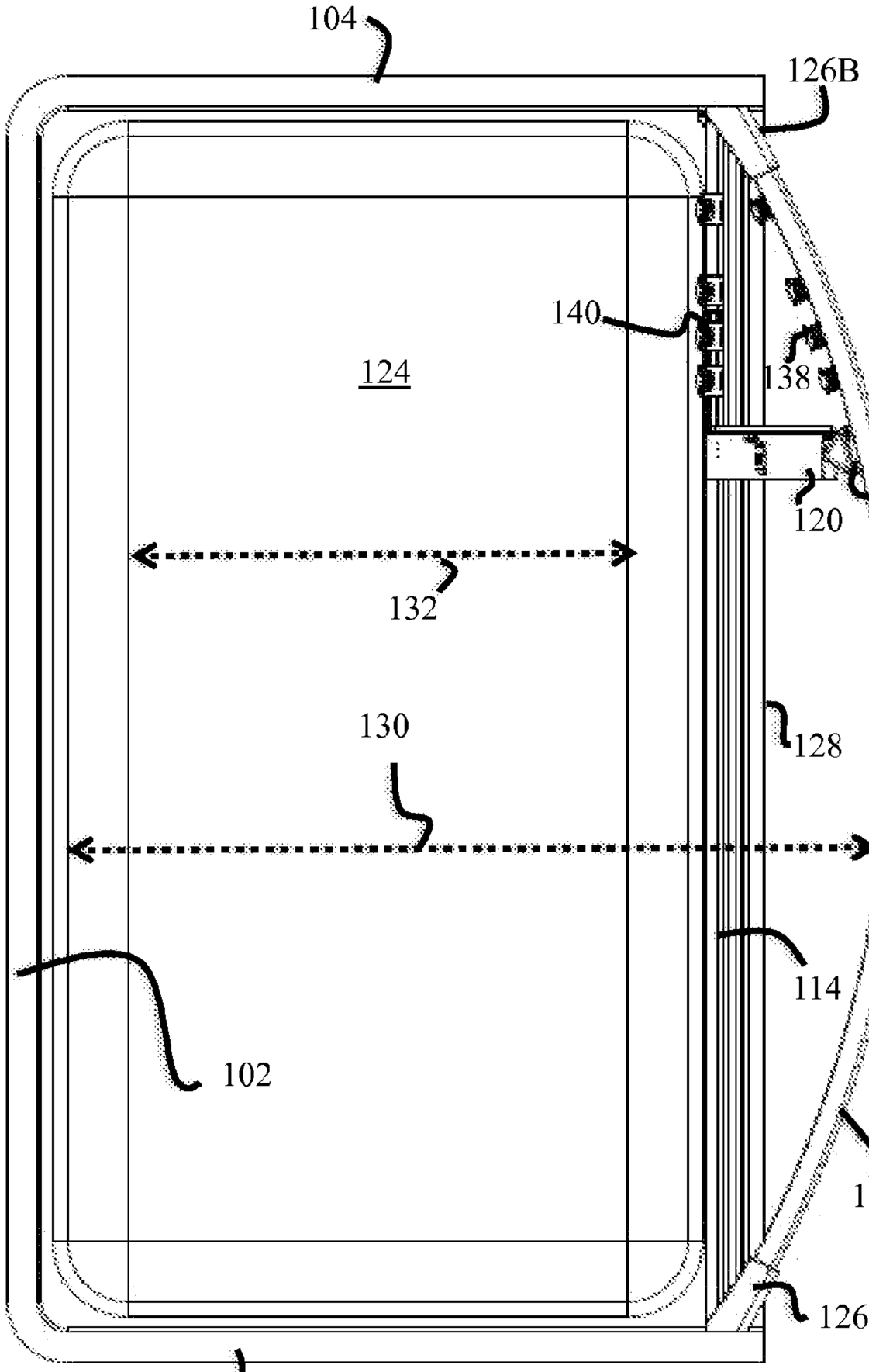
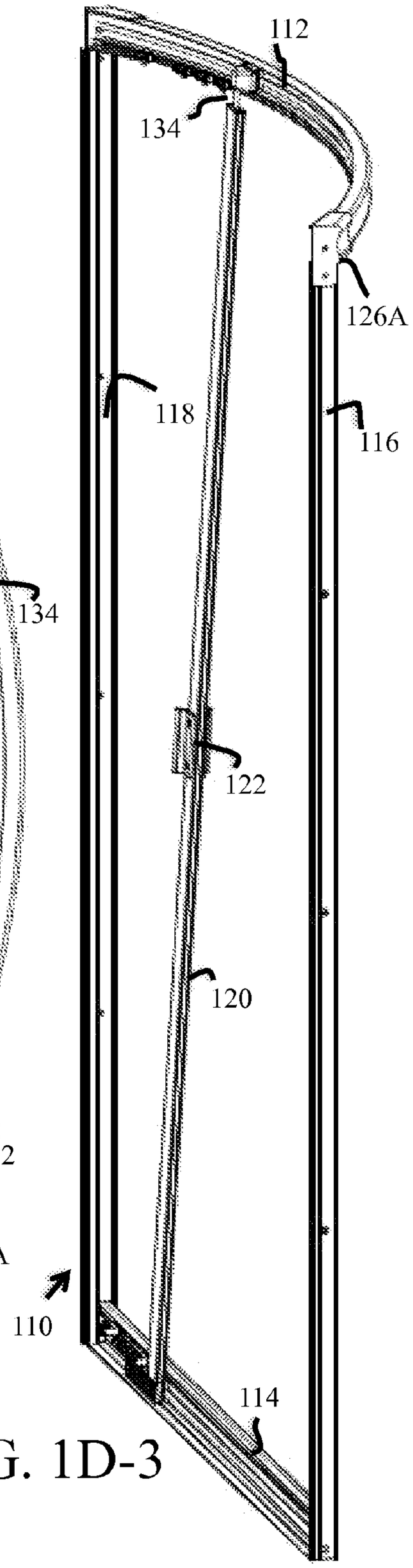


FIG. 1D-2



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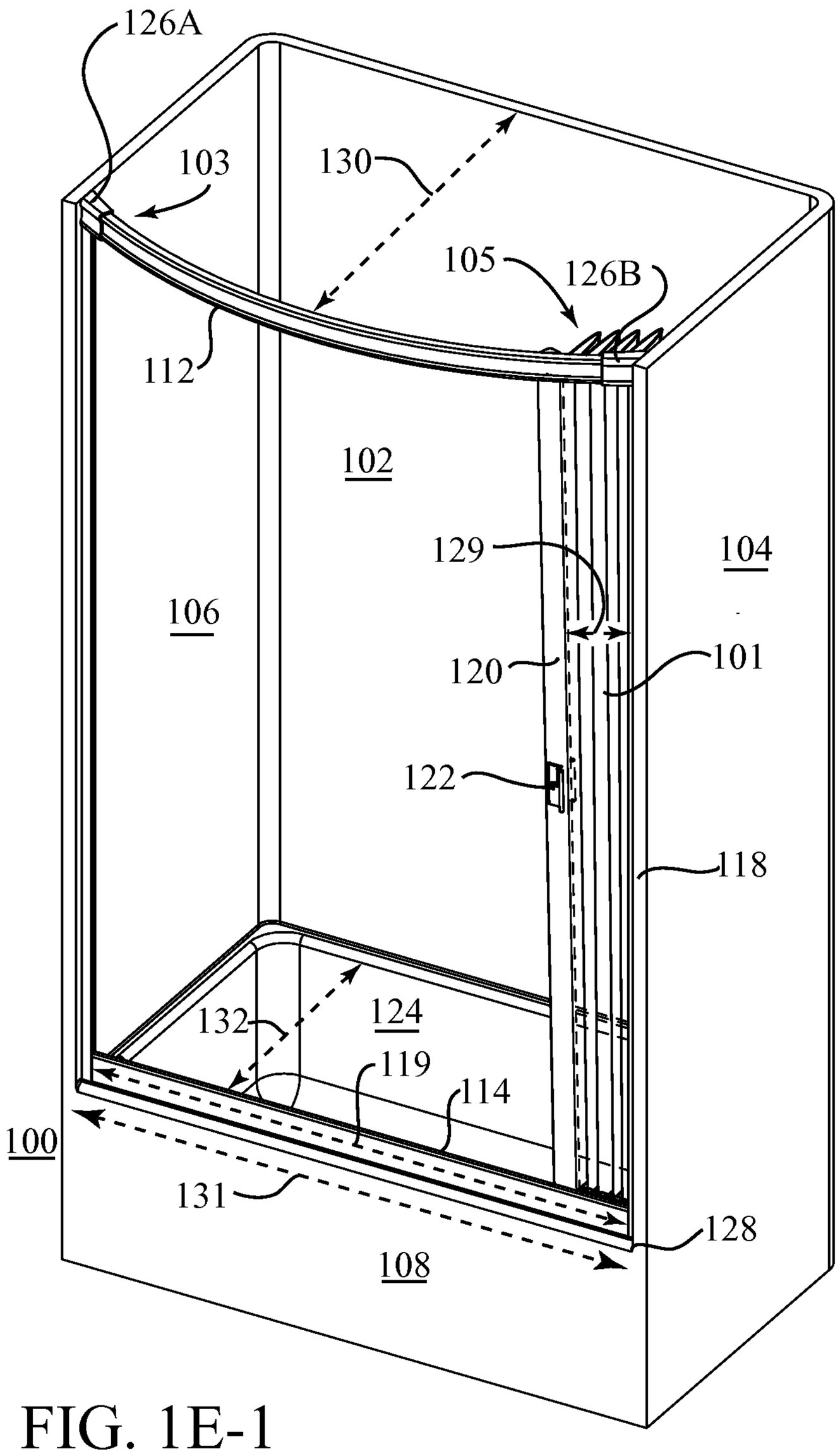
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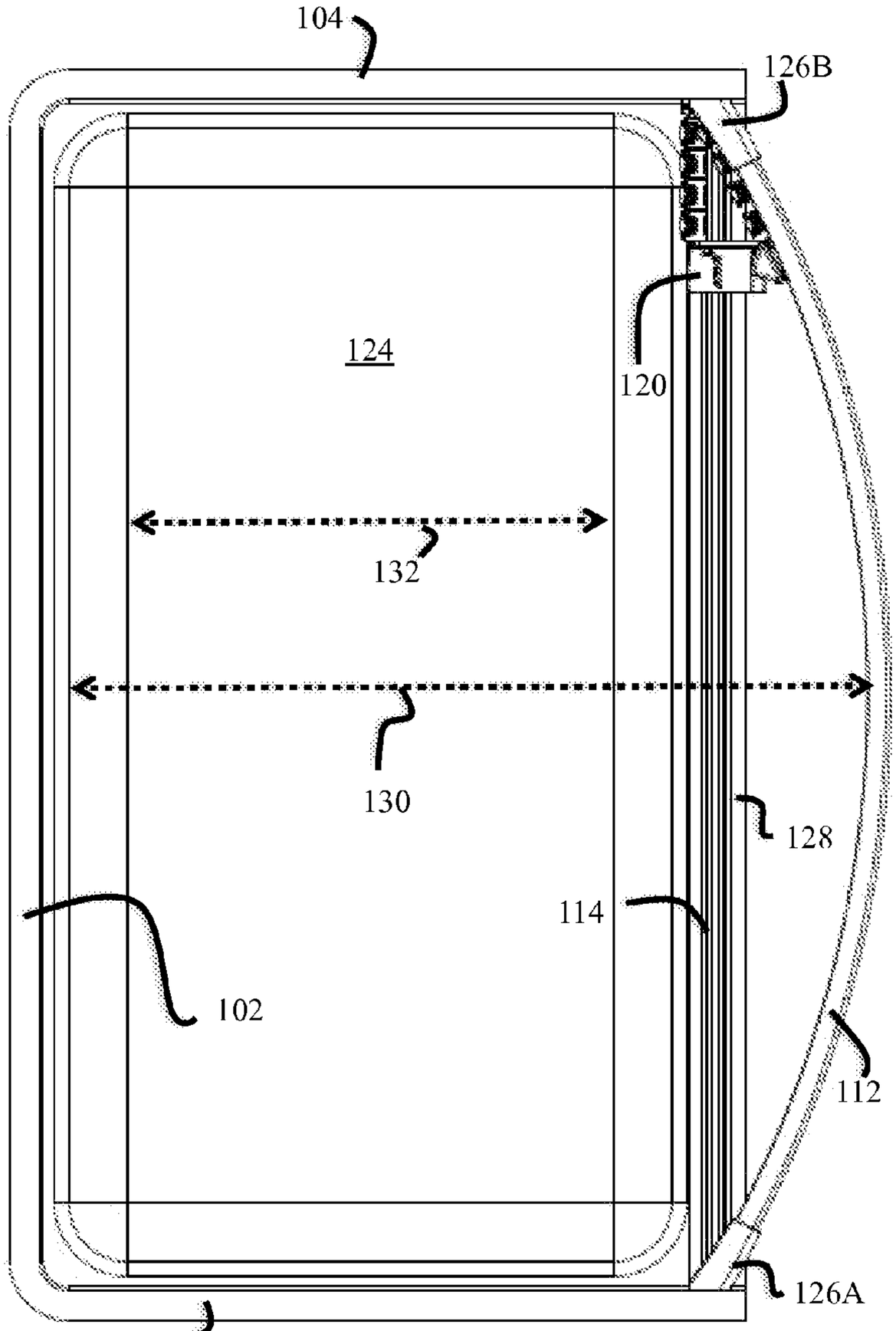
FIG. 1E-1



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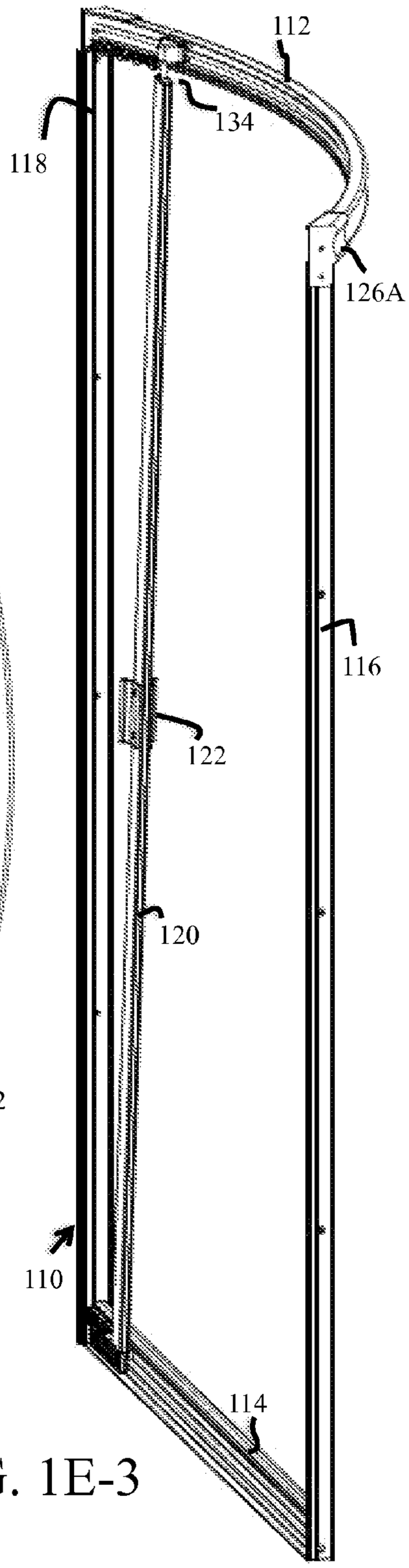

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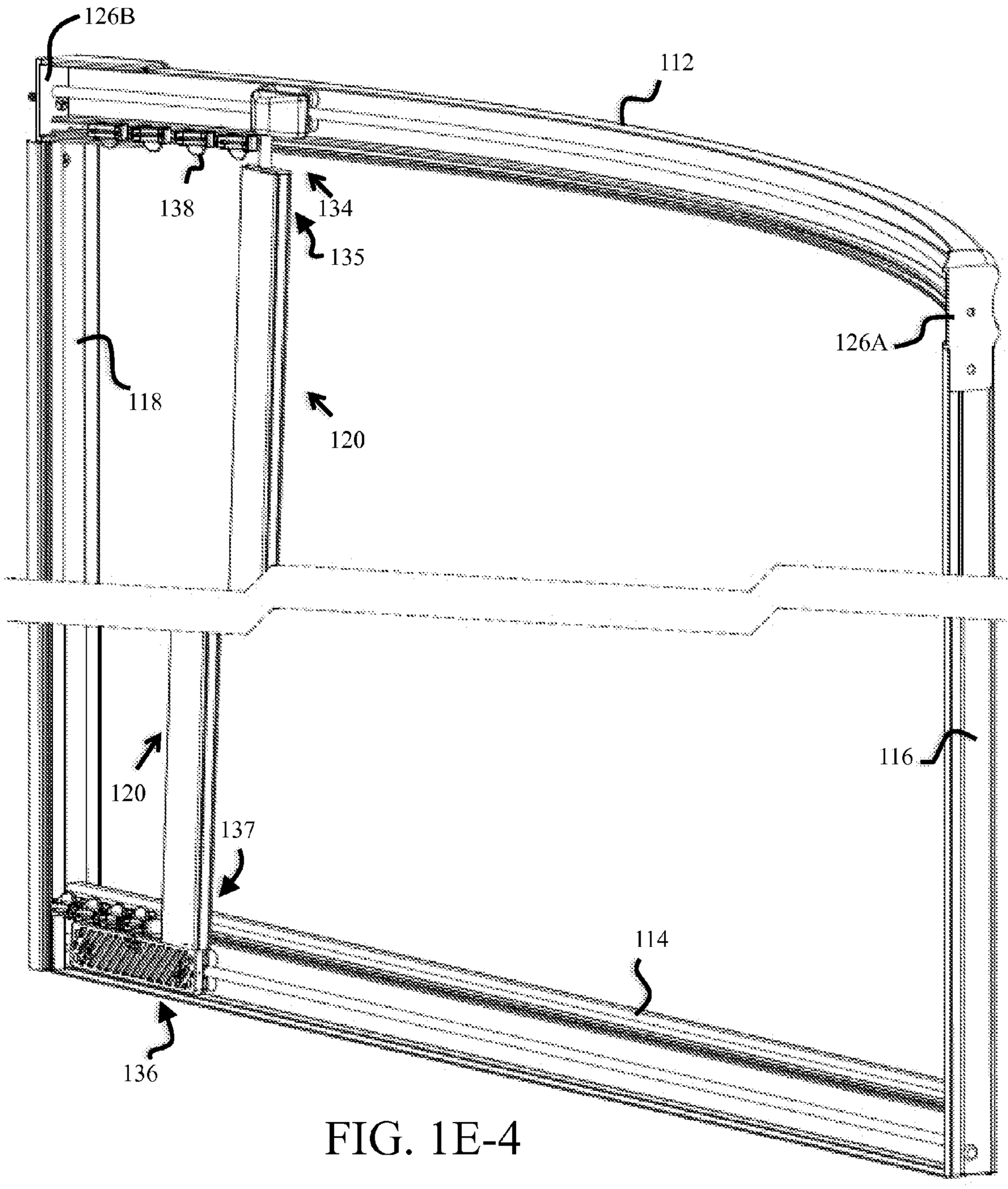

FIG. 1E-4

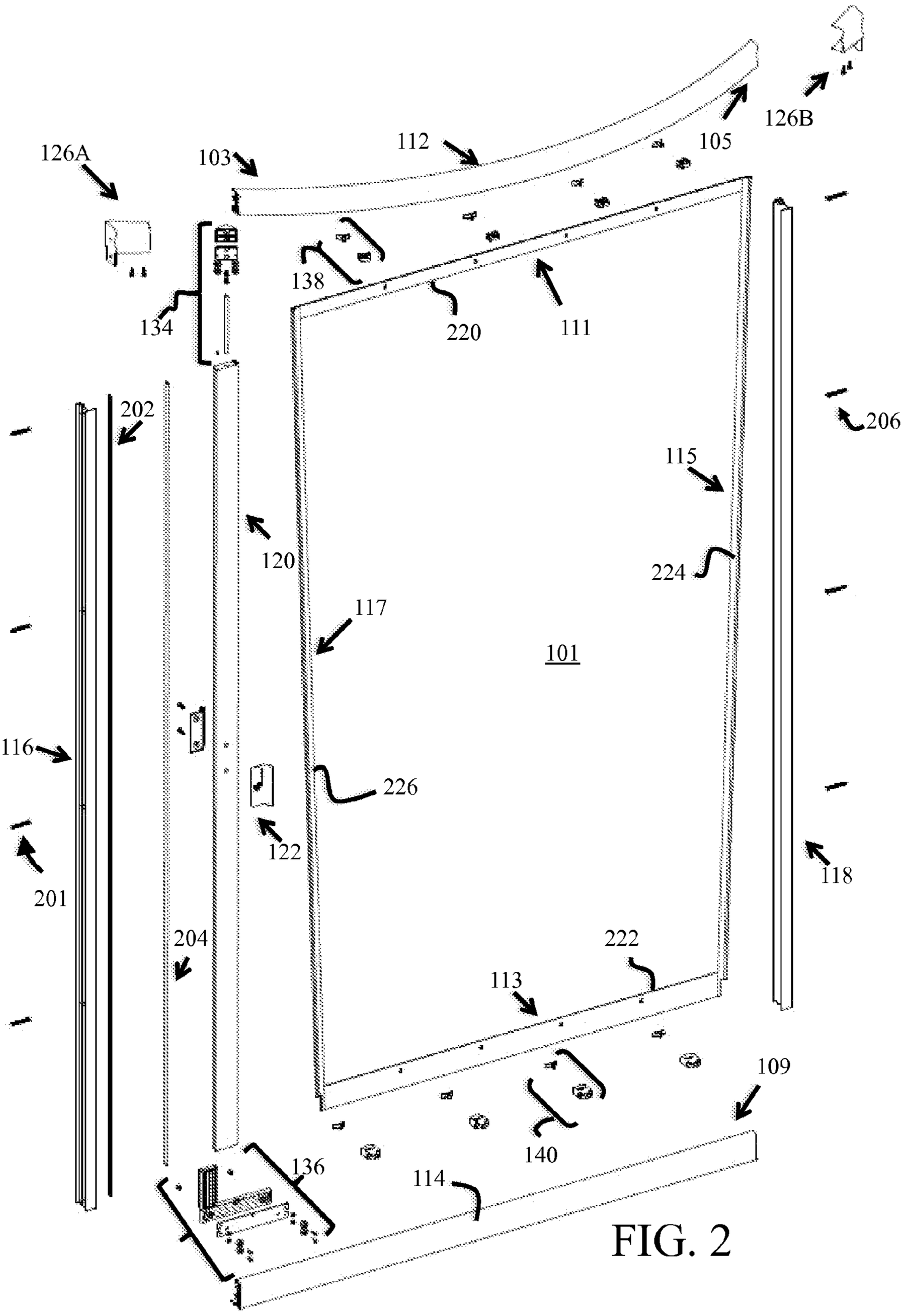
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FIG. 2

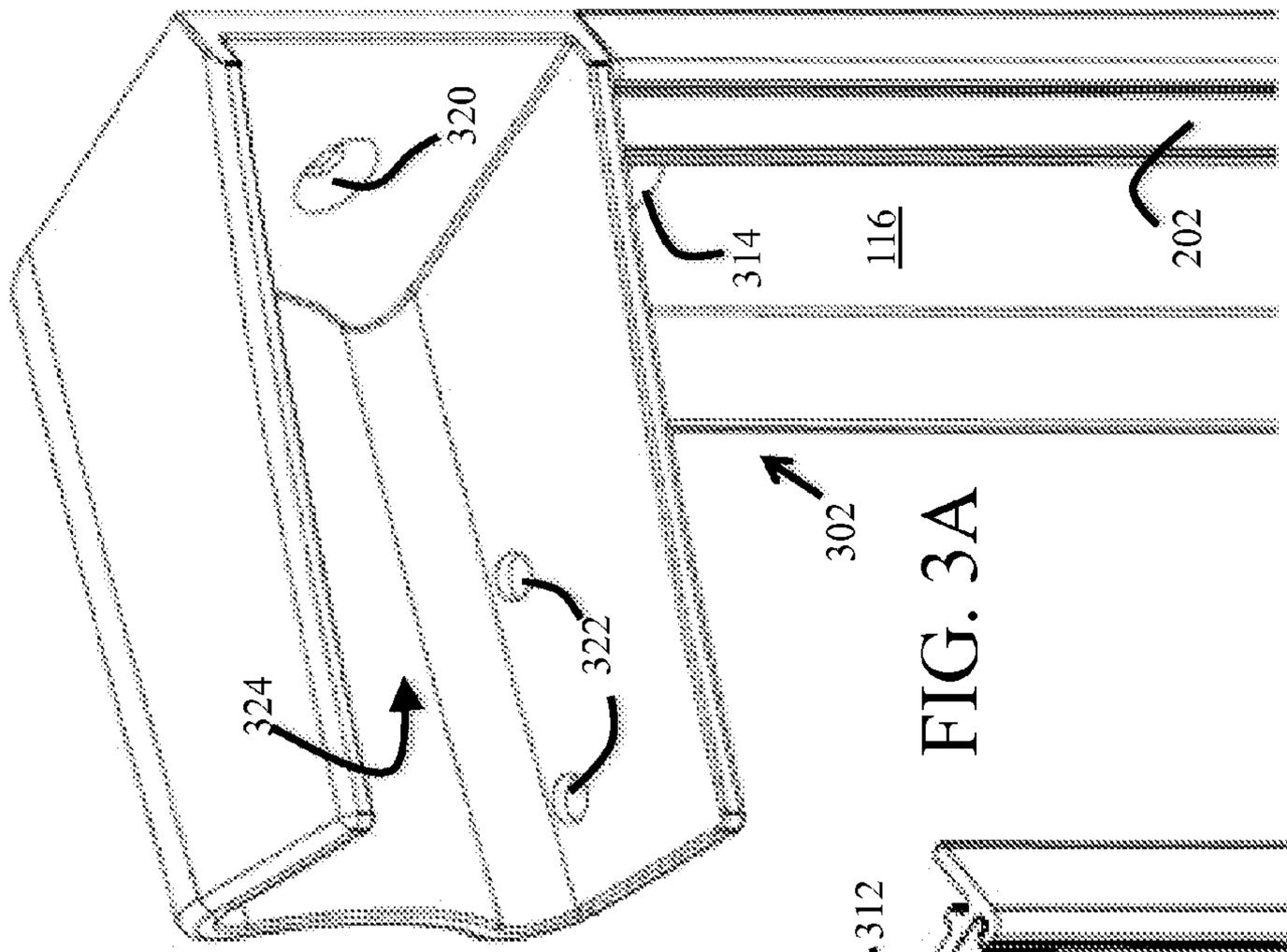

FIG. 3A

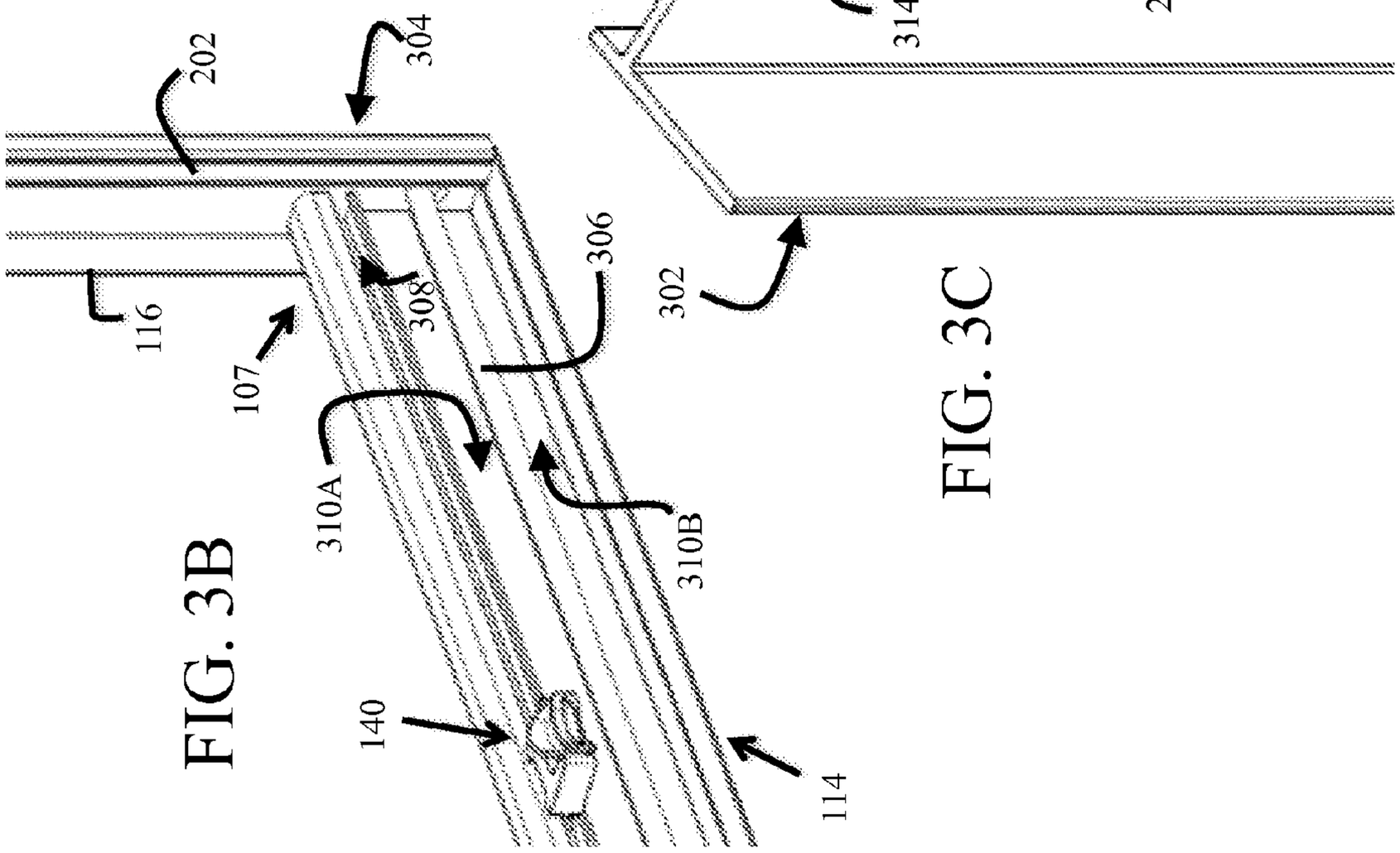

FIG. 3B

FIG. 3C

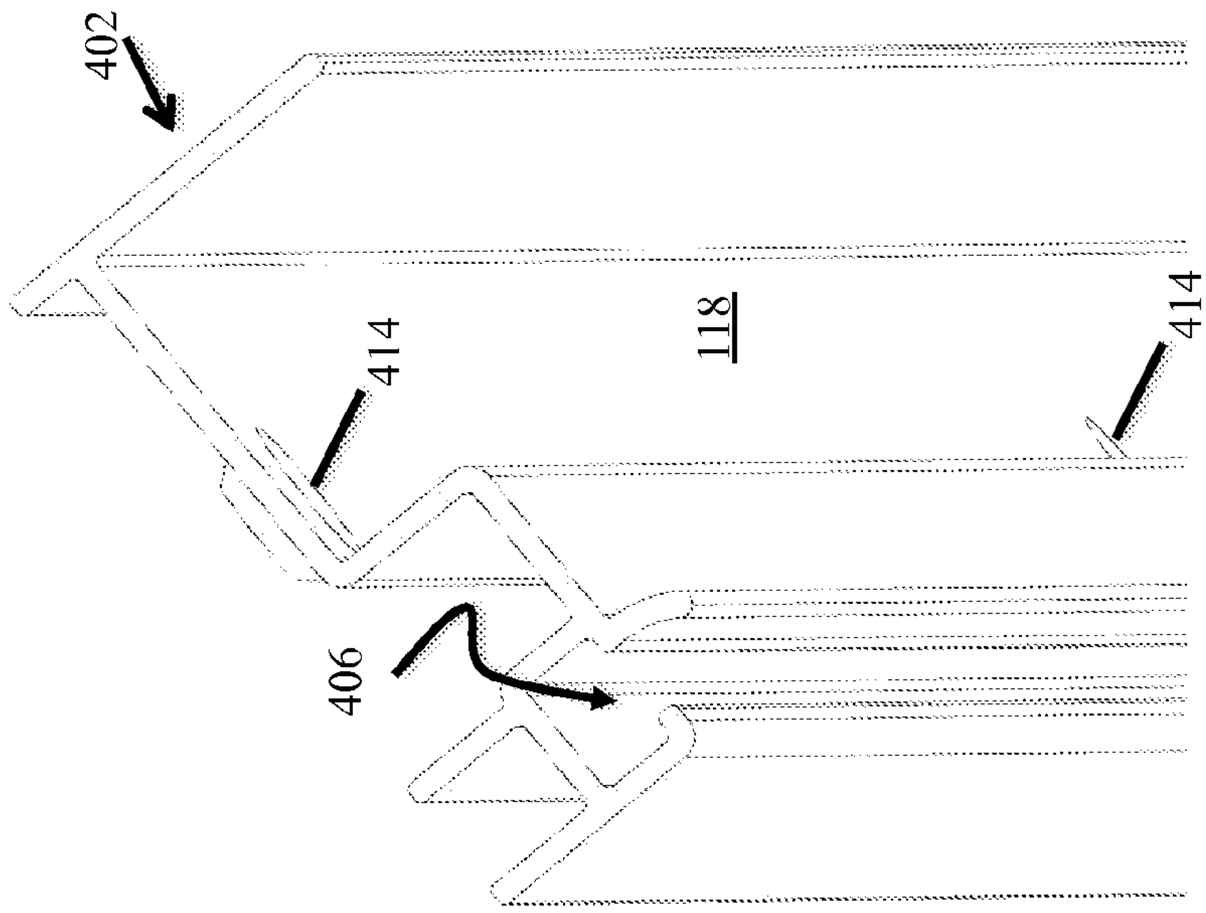
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FIG. 4B

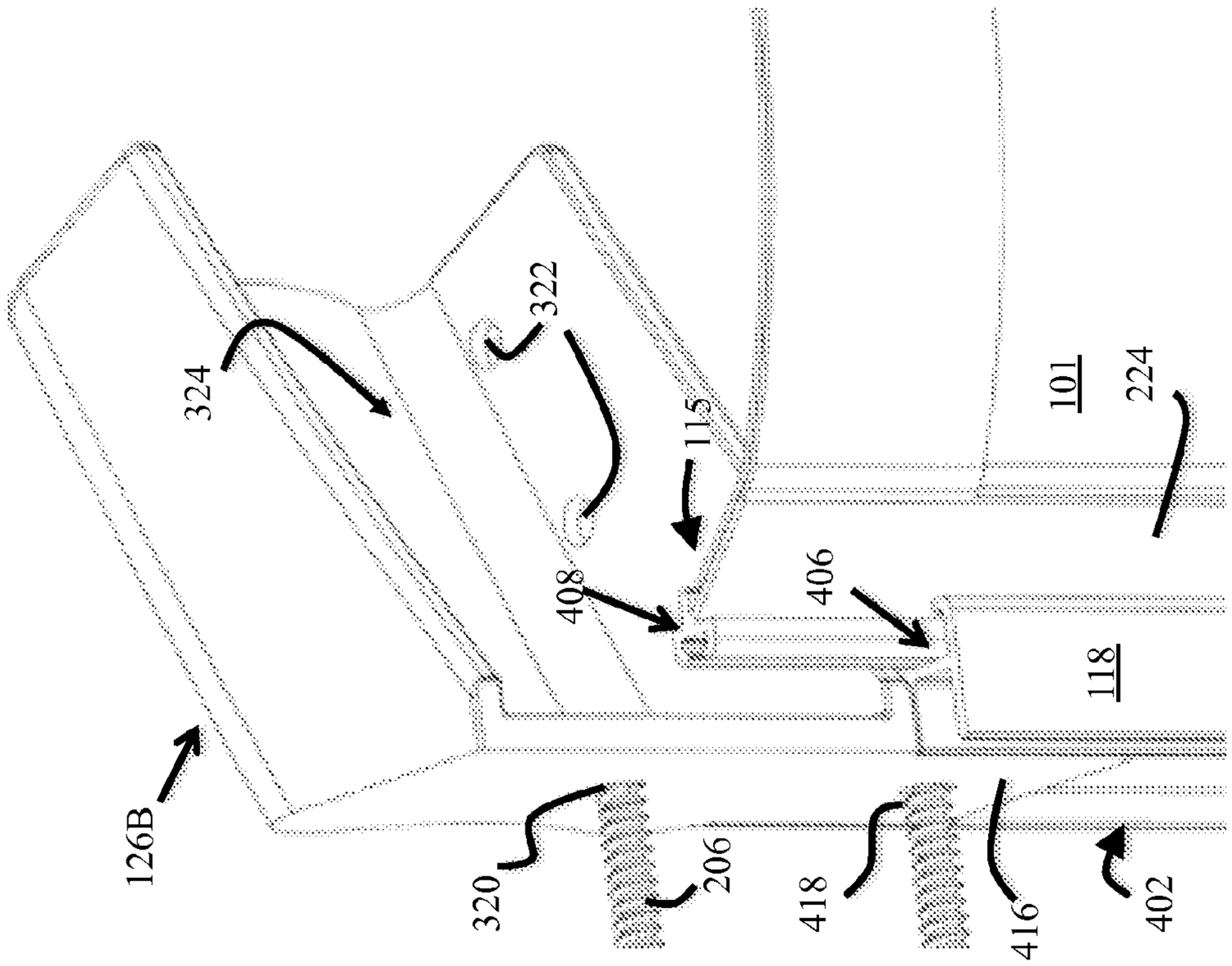
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FIG. 4A

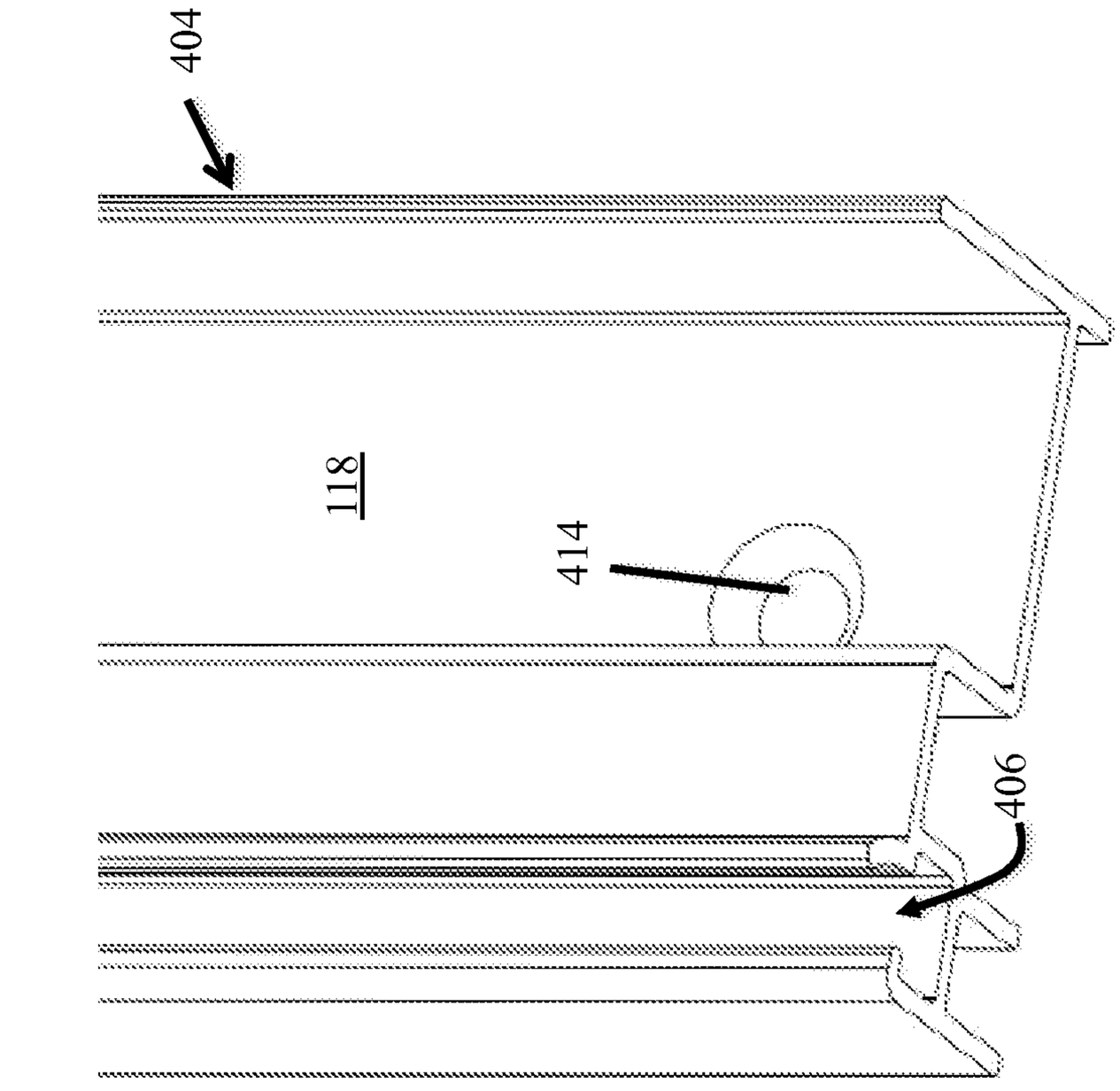


FIG. 4D

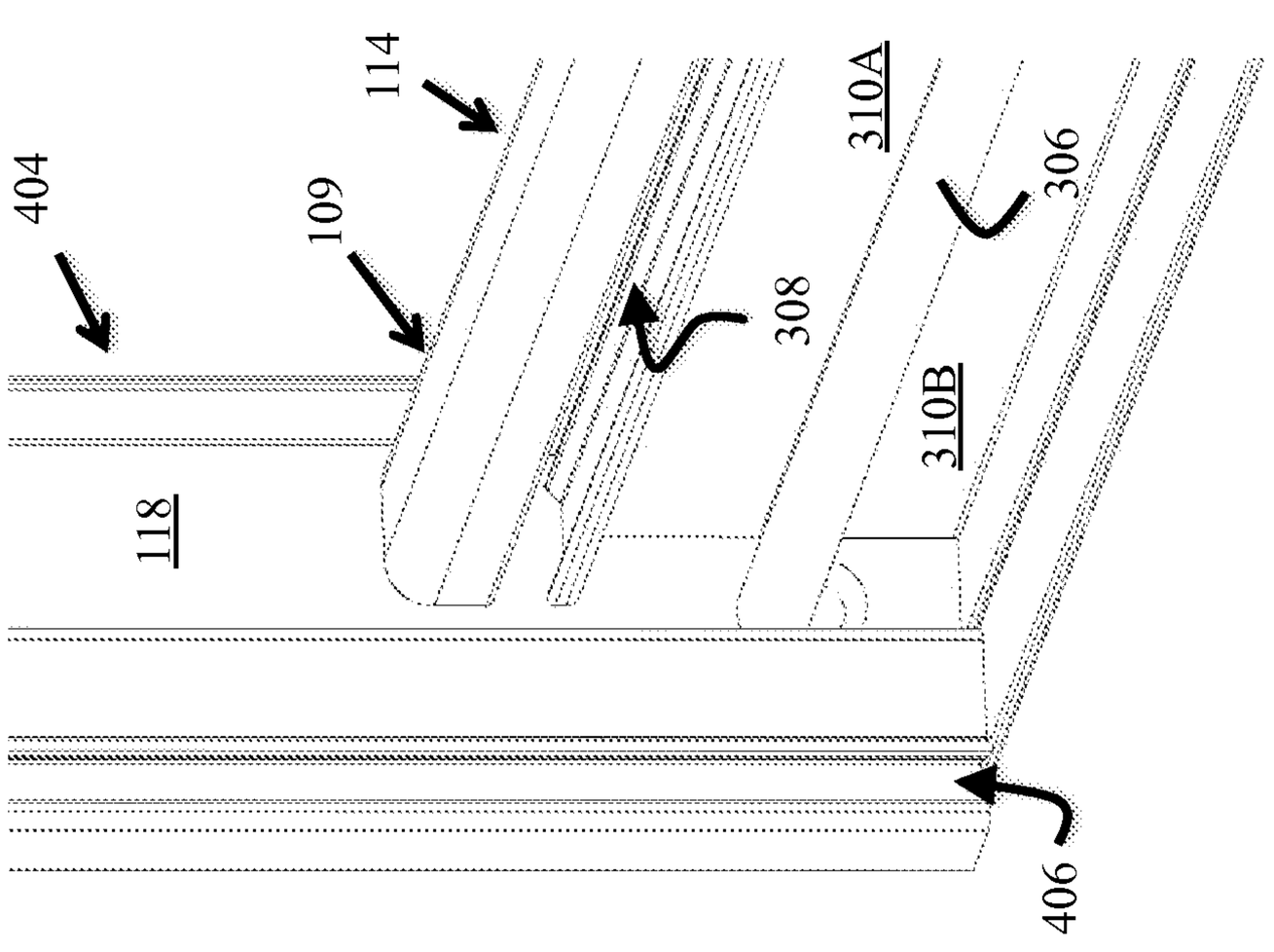


FIG. 4C

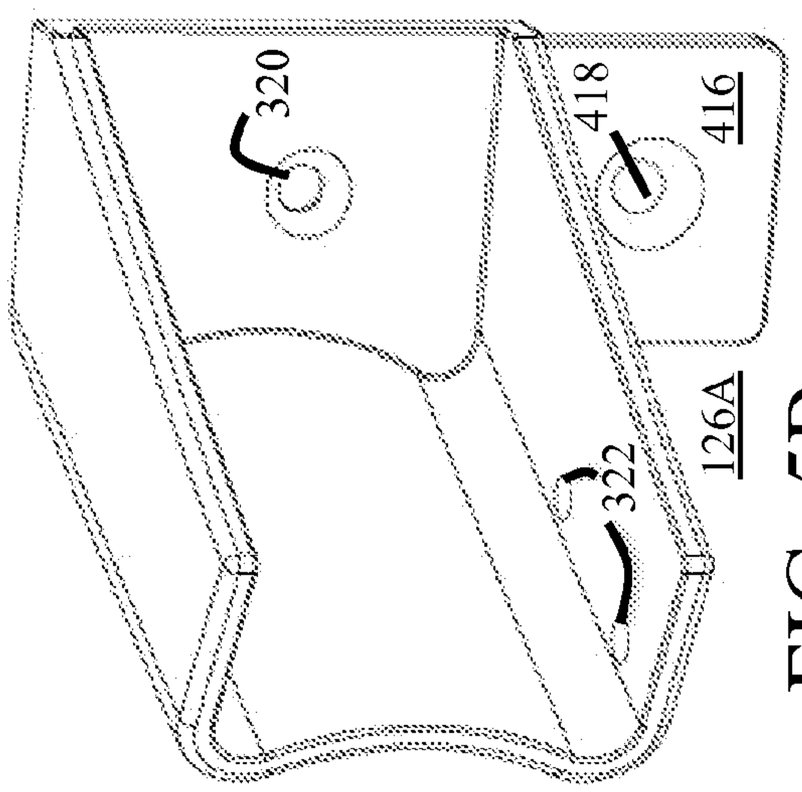


FIG. 5B

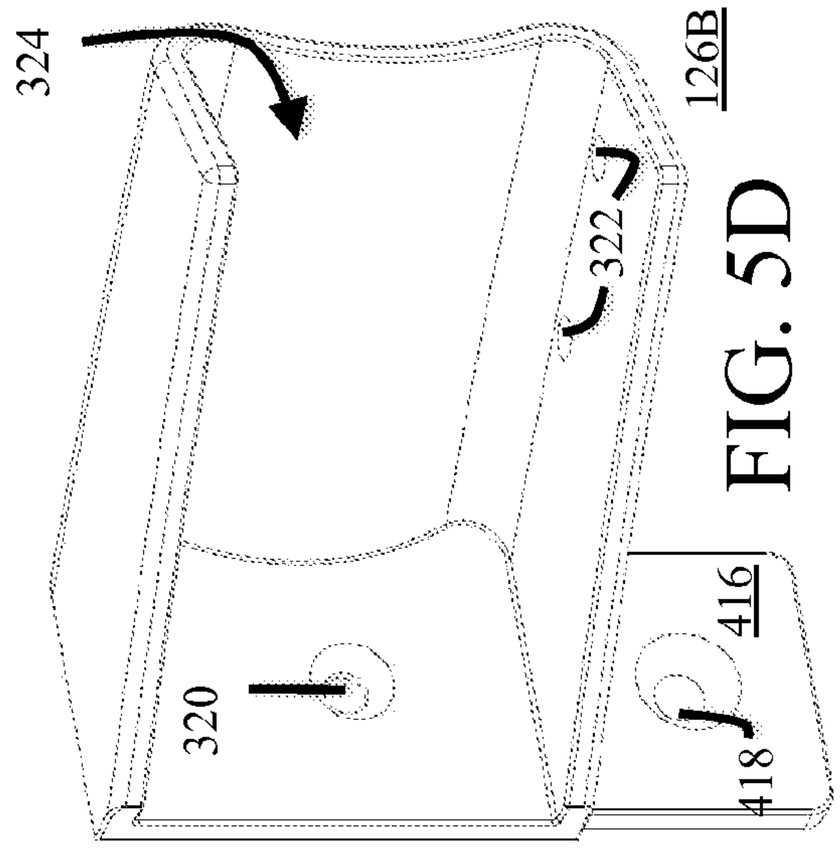


FIG. 5D

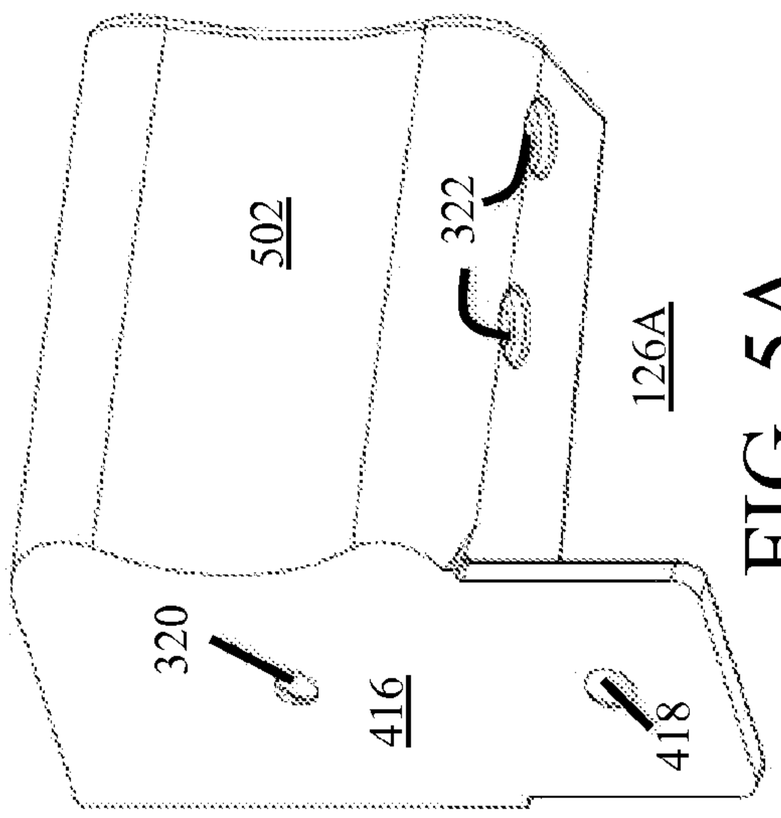


FIG. 5A

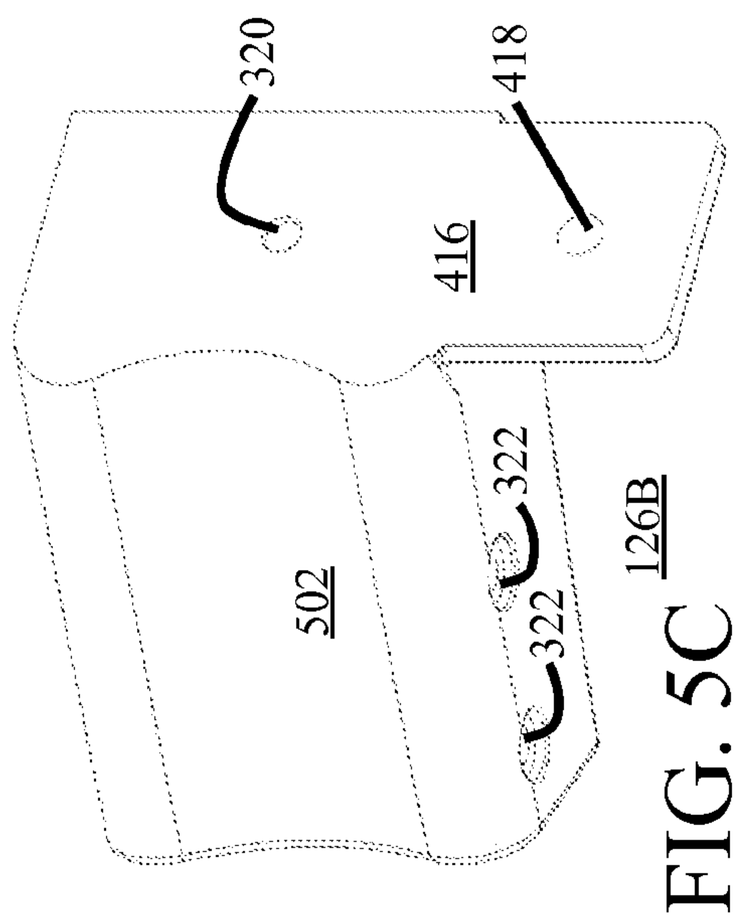


FIG. 5C

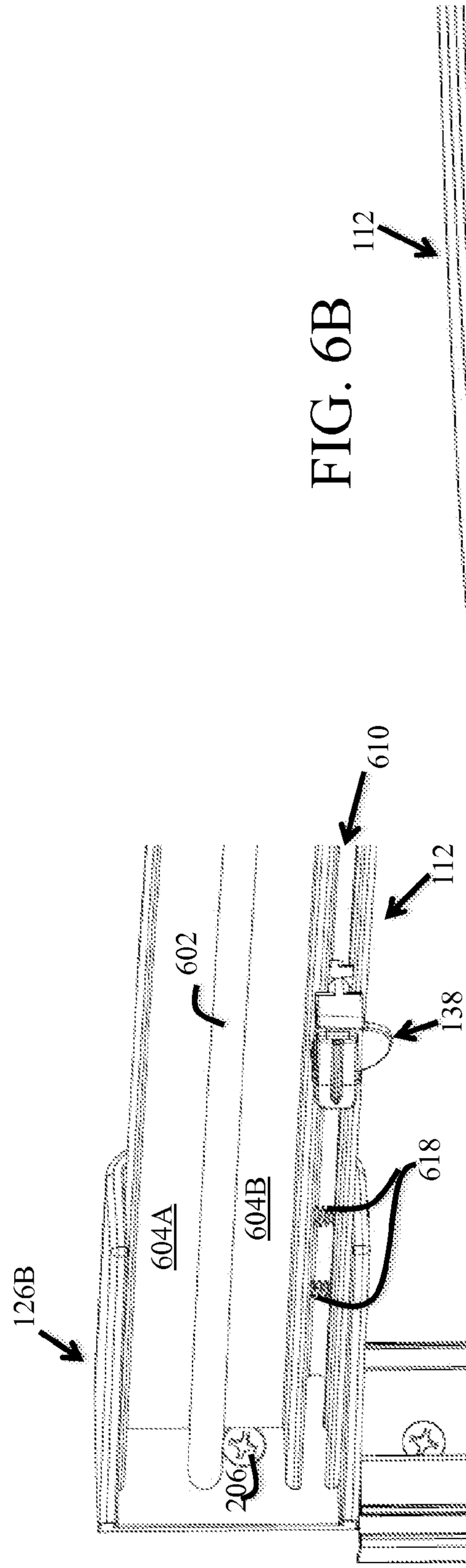

602
604A
604B
126B
206
618
610
112
138
118
406

FIG. 6A

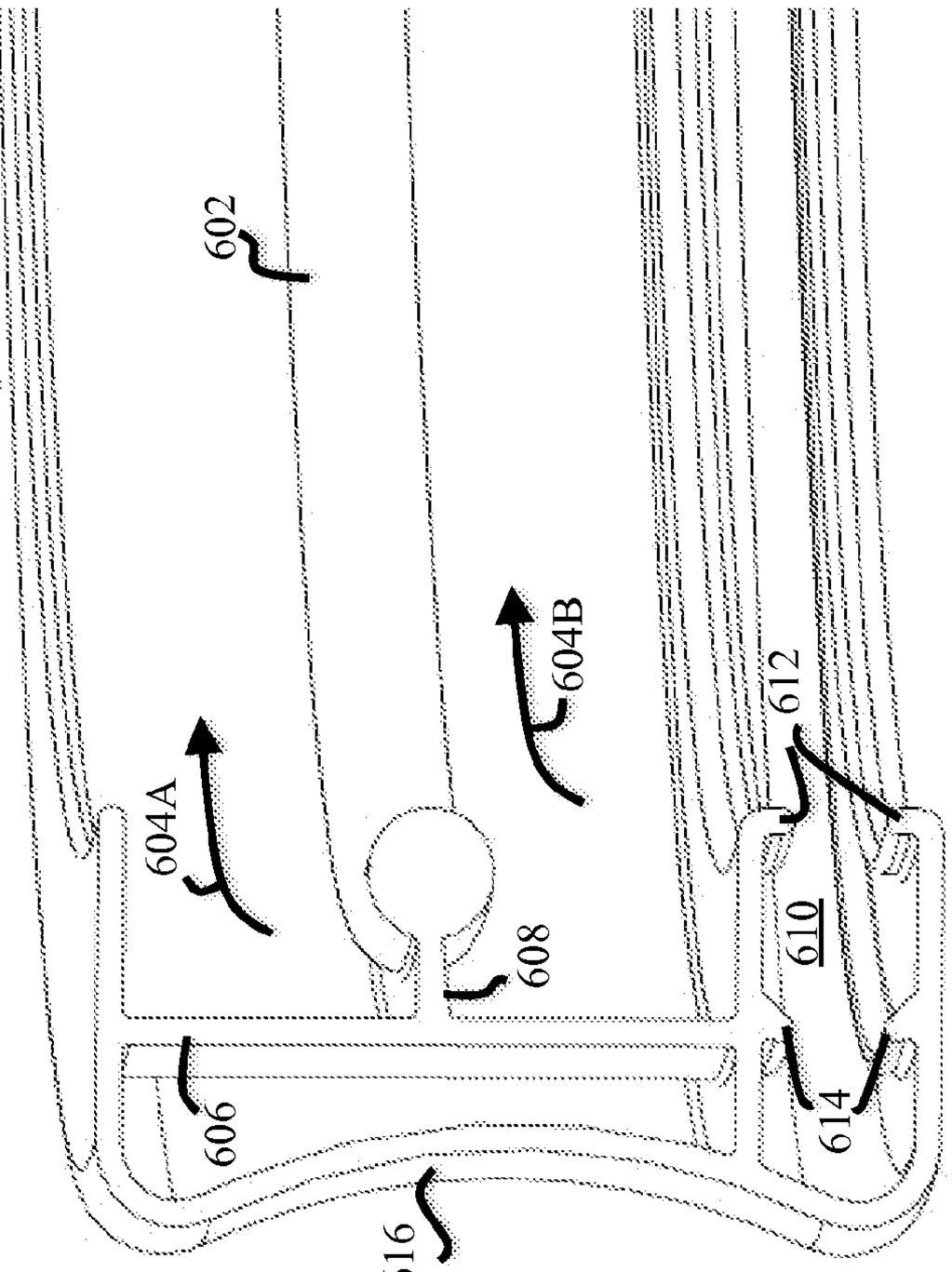

602
112
604A
604B
606
608
610
612
614
616

FIG. 6B

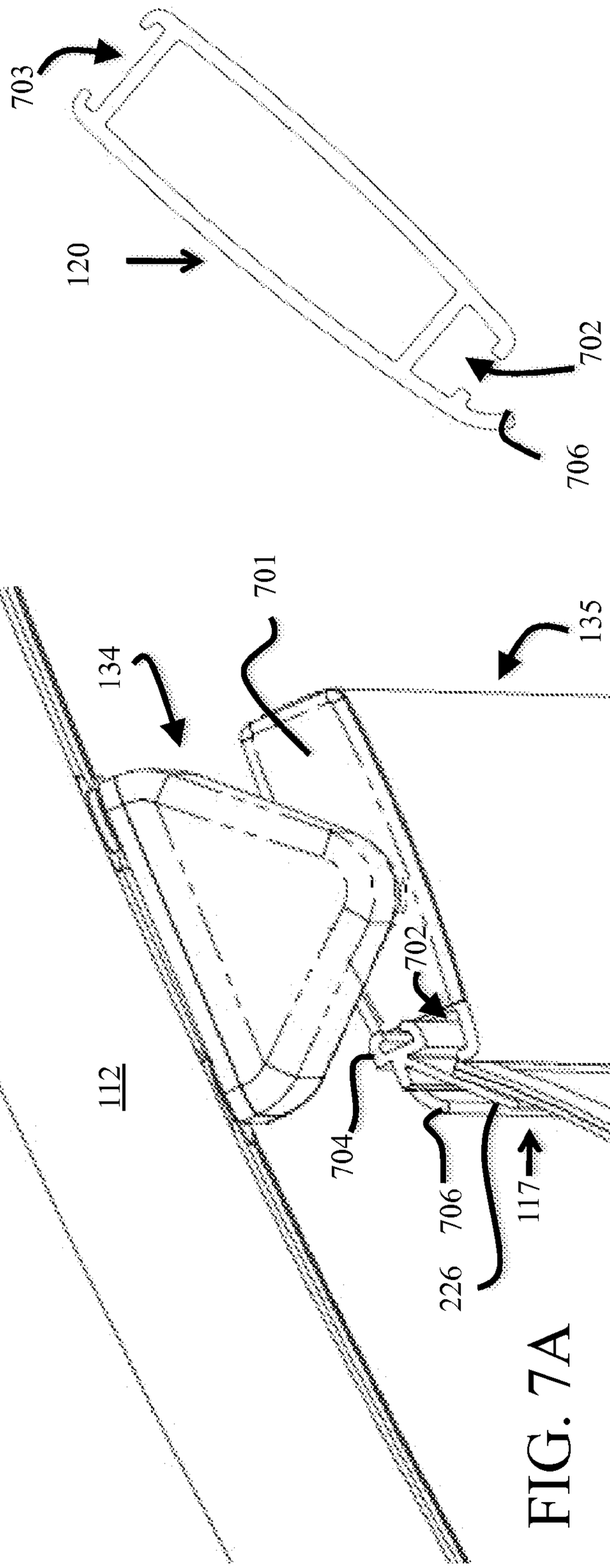


FIG. 7A

FIG. 7B

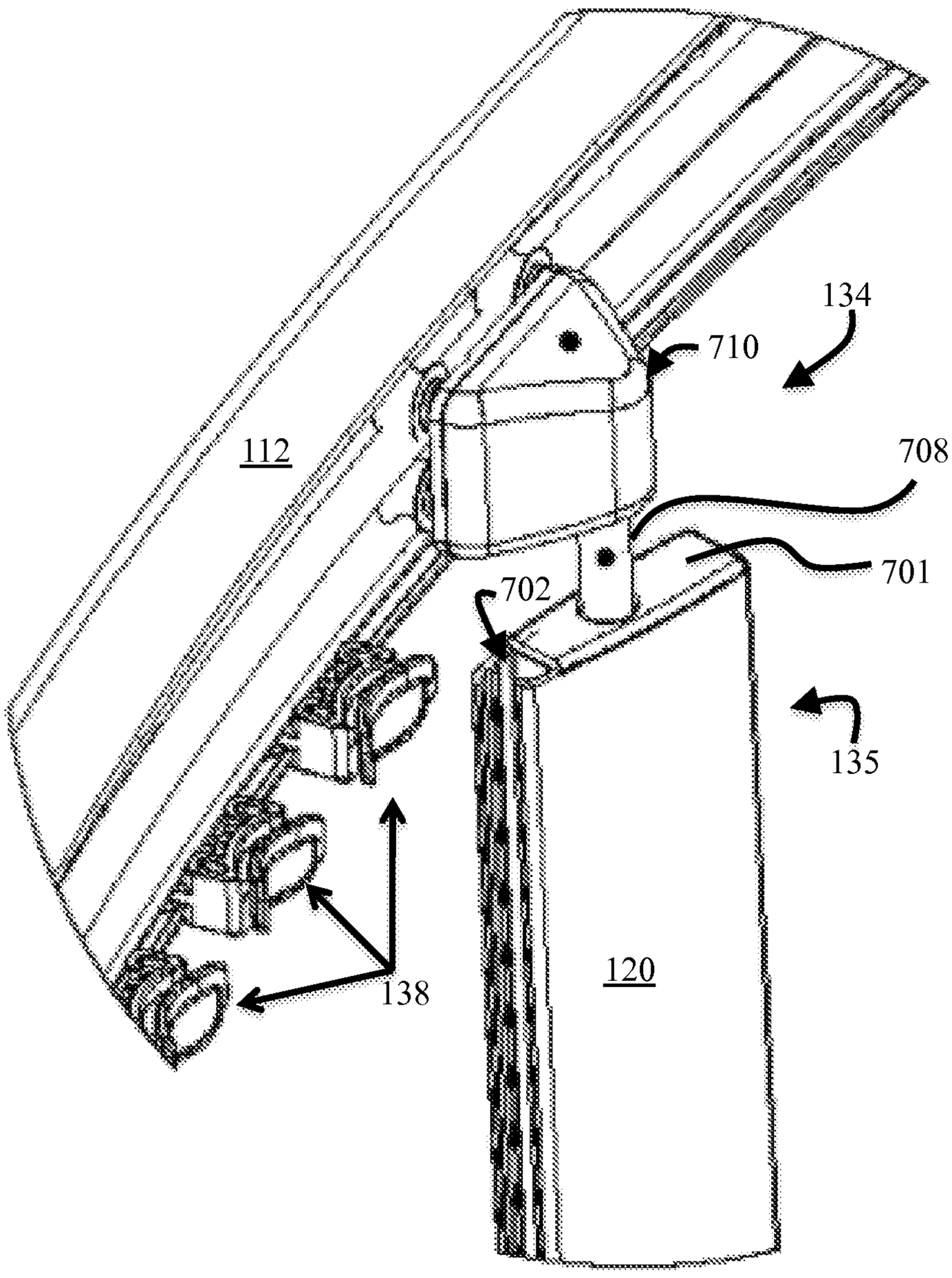


FIG. 7C

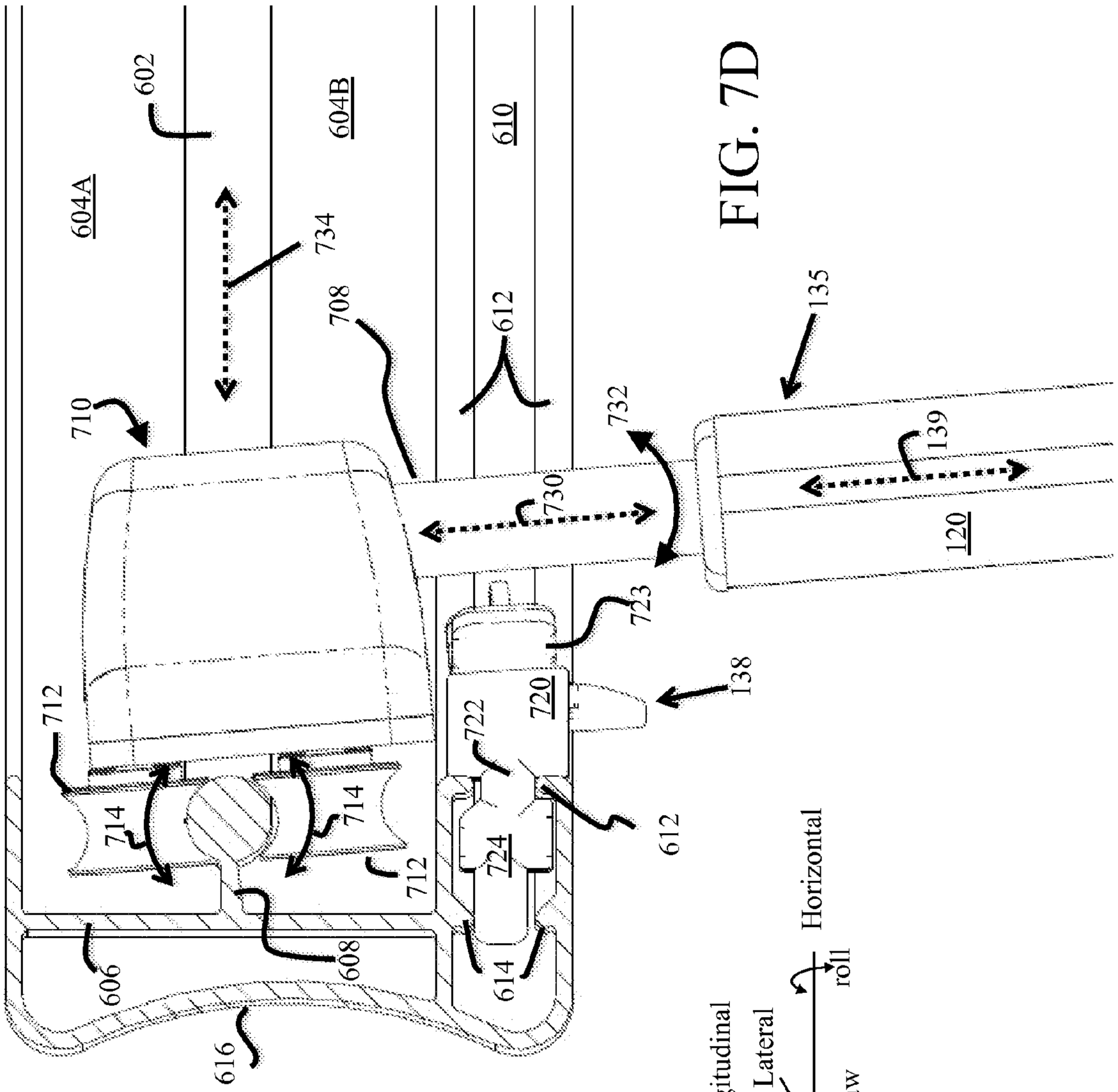

602
604A
604B
610
734
708
612
710
732
135
139
730
120
723
712
720
138
722
714
714
724
612
712
606
608
614
616
Horizontal
Vertical/Longitudinal
Lateral
roll
yaw
pitch
Z
X
y

FIG. 7D

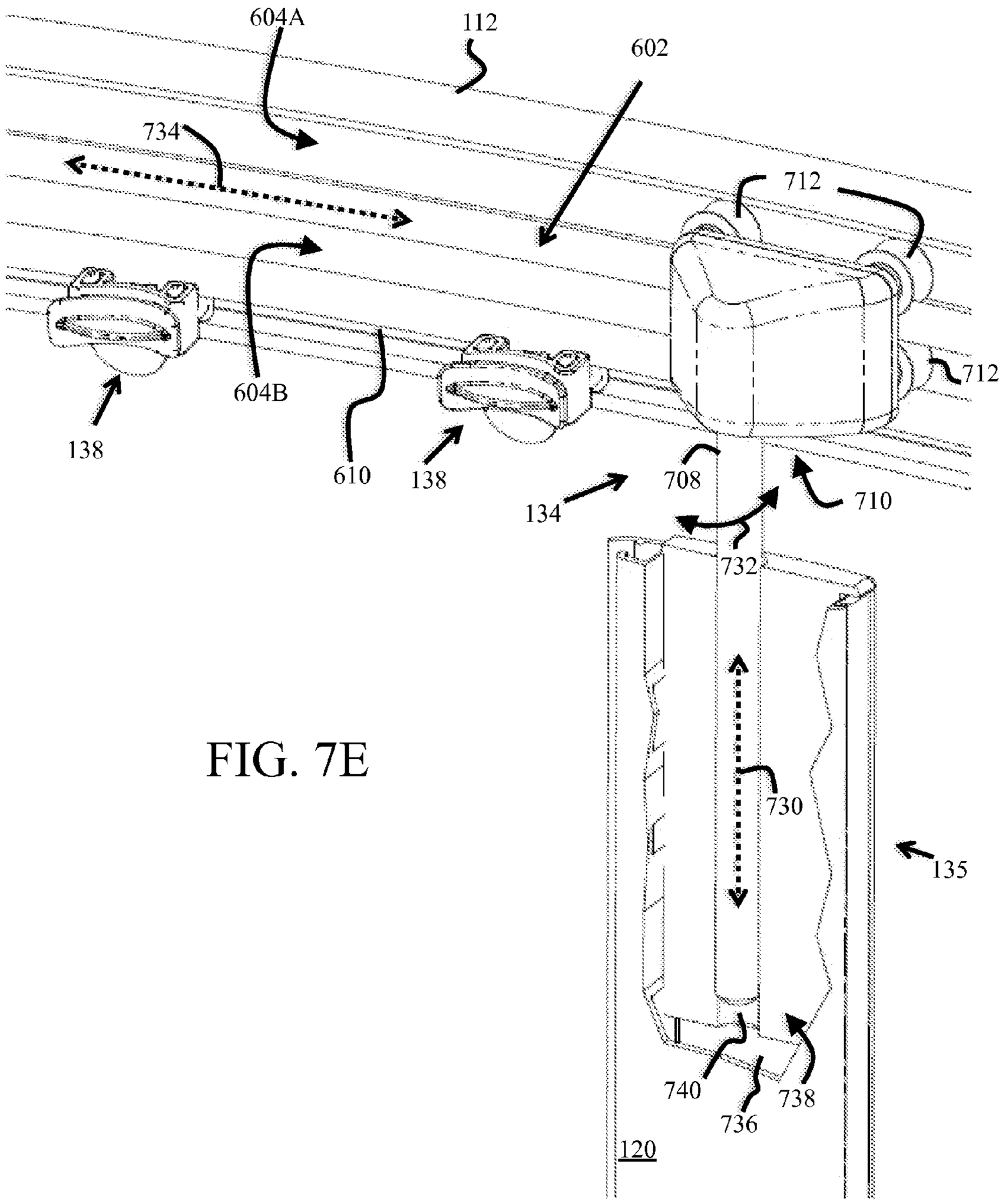

604A
112
602
734
712
712
604B
138
610
138
134
708
710
732
730
135
740
738
736
120

FIG. 7E

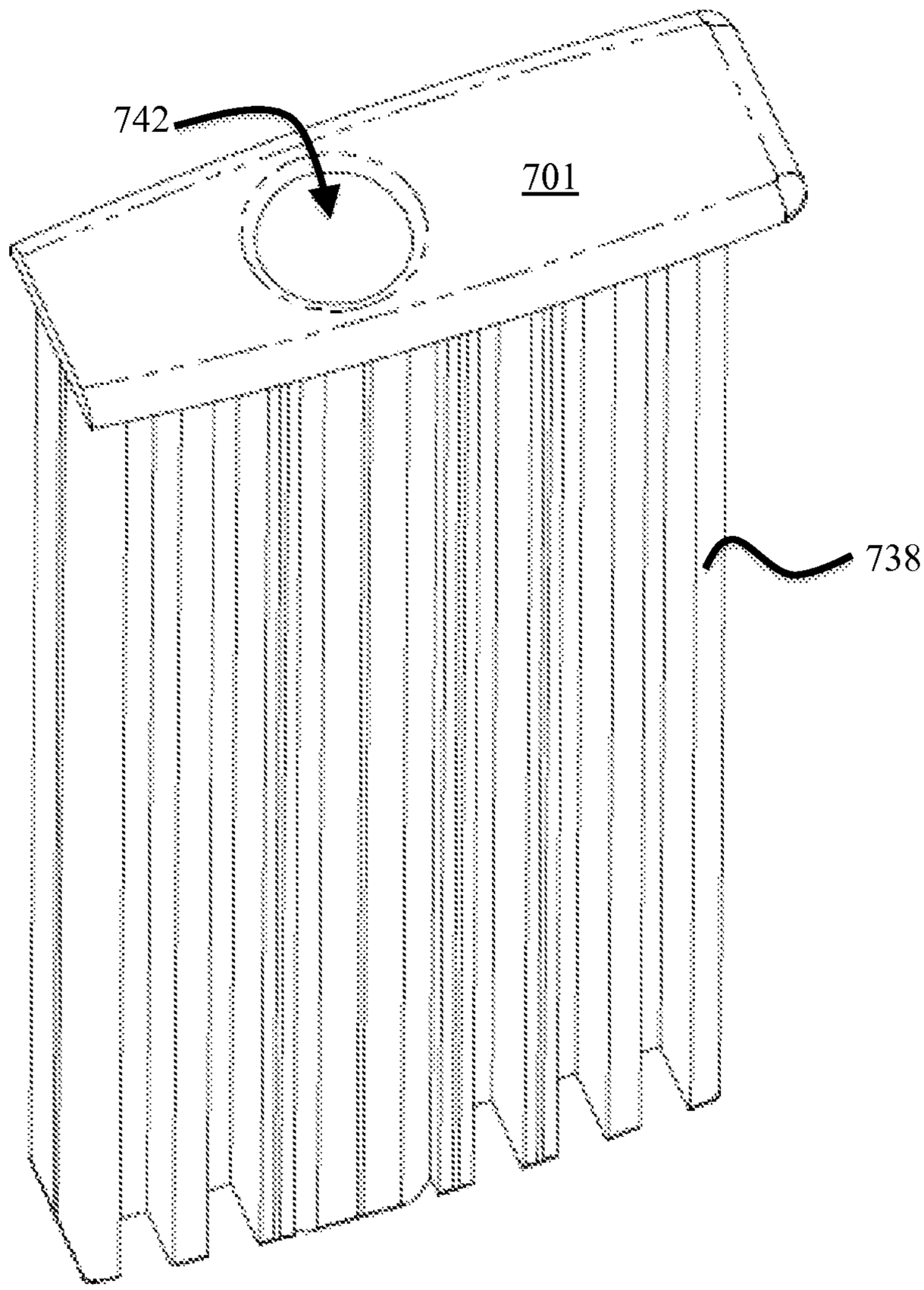


FIG. 7F

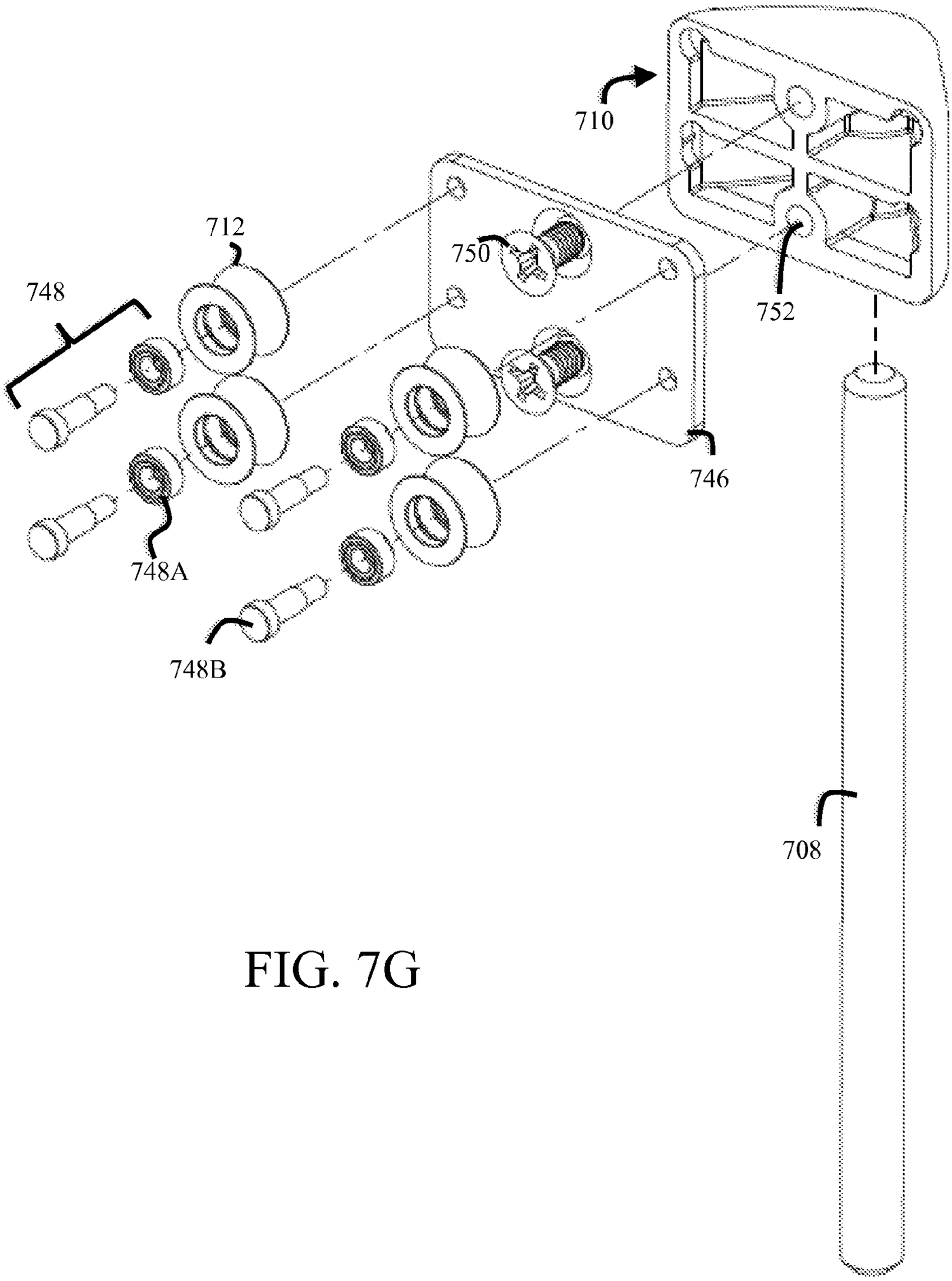


FIG. 7G

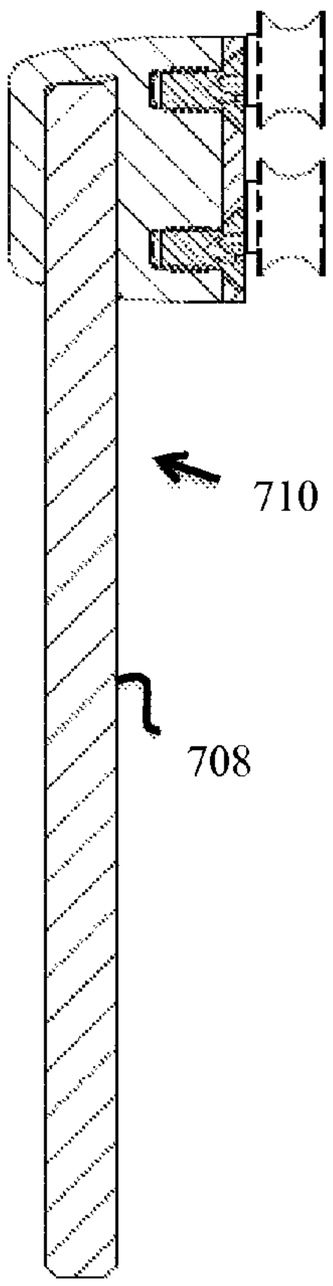


FIG. 7H-2

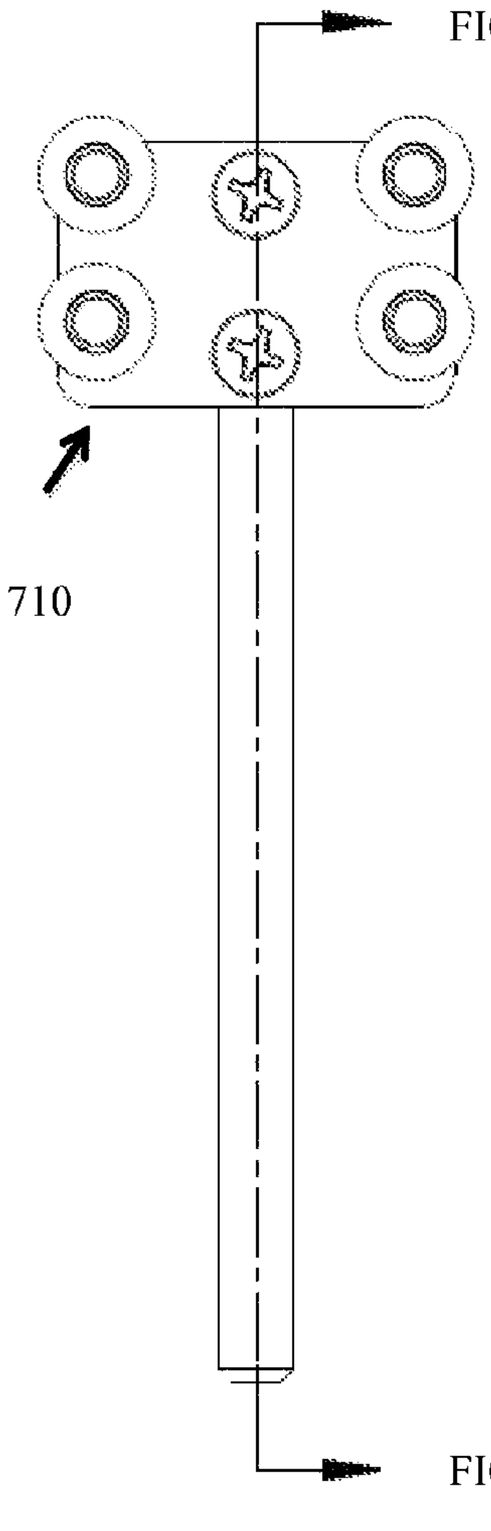
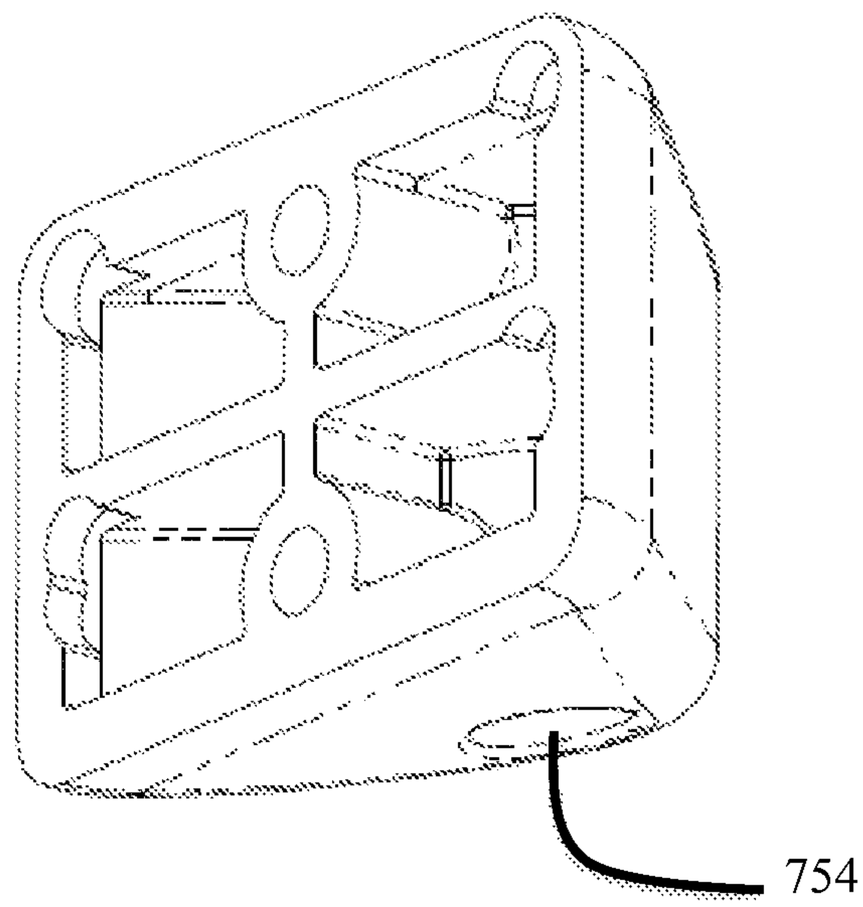


FIG. 7H-1



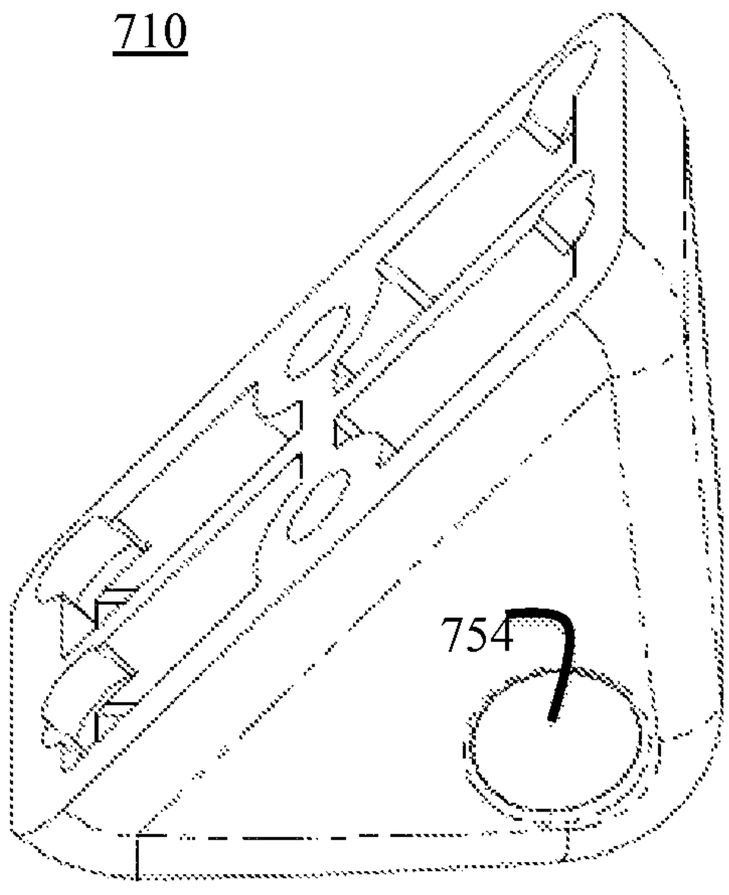
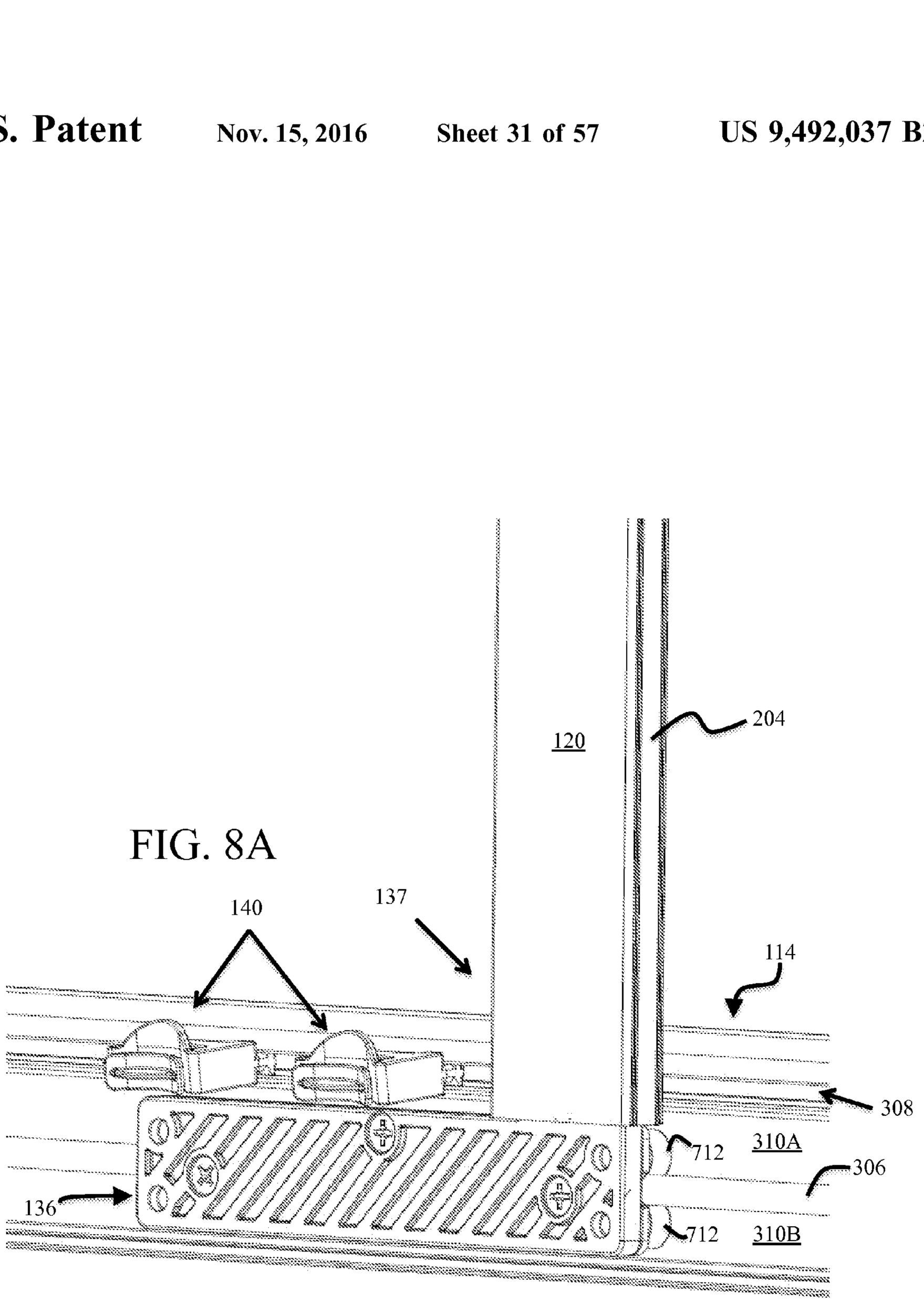


FIG. 7I

FIG. 8A



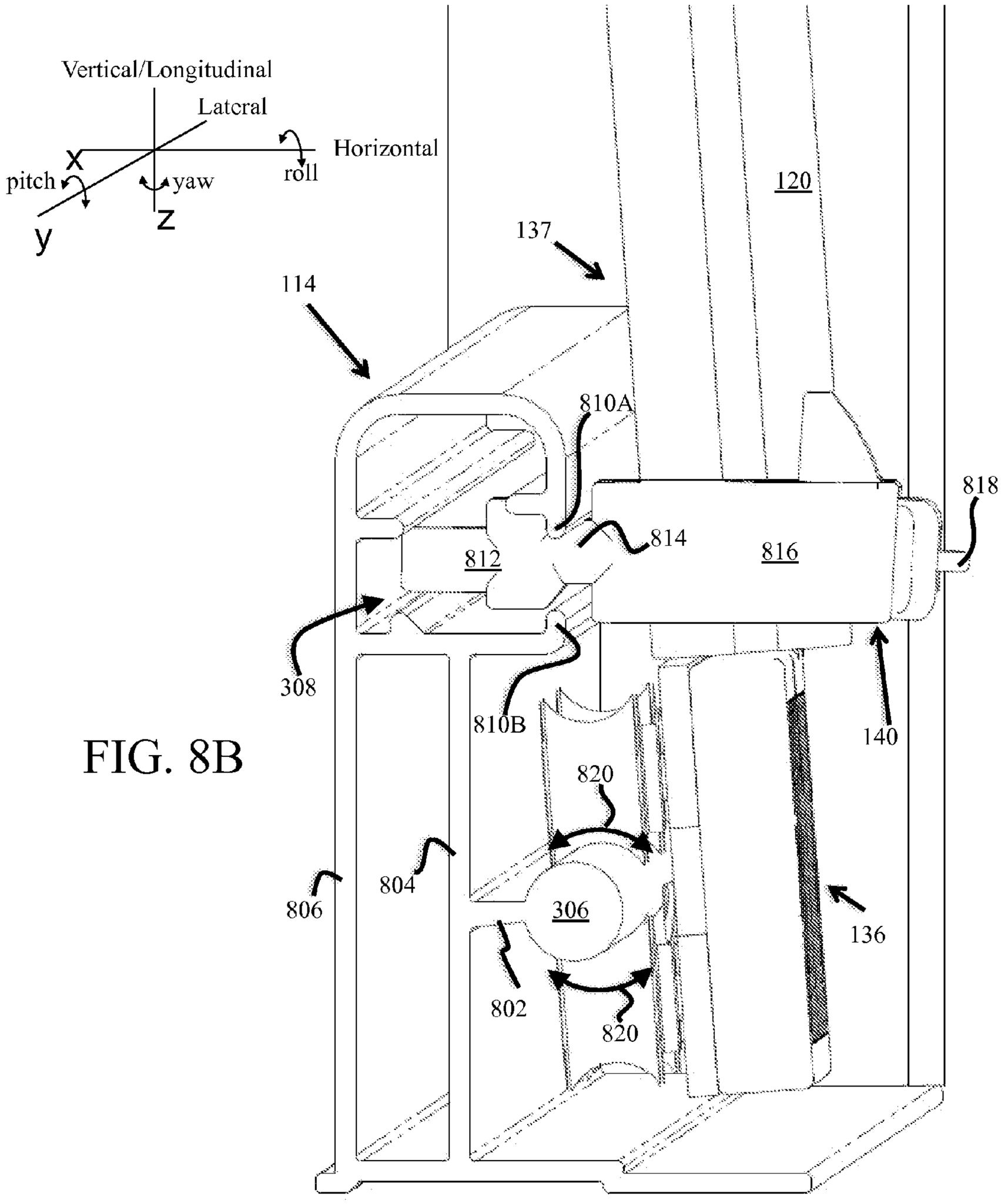

Vertical/Longitudinal
Lateral
Horizontal
x
pitch
yaw
roll
z
y
114
137
120
810A
818
814
812
816
308
810B
140
820
804
806
306
136
802
820

FIG. 8B

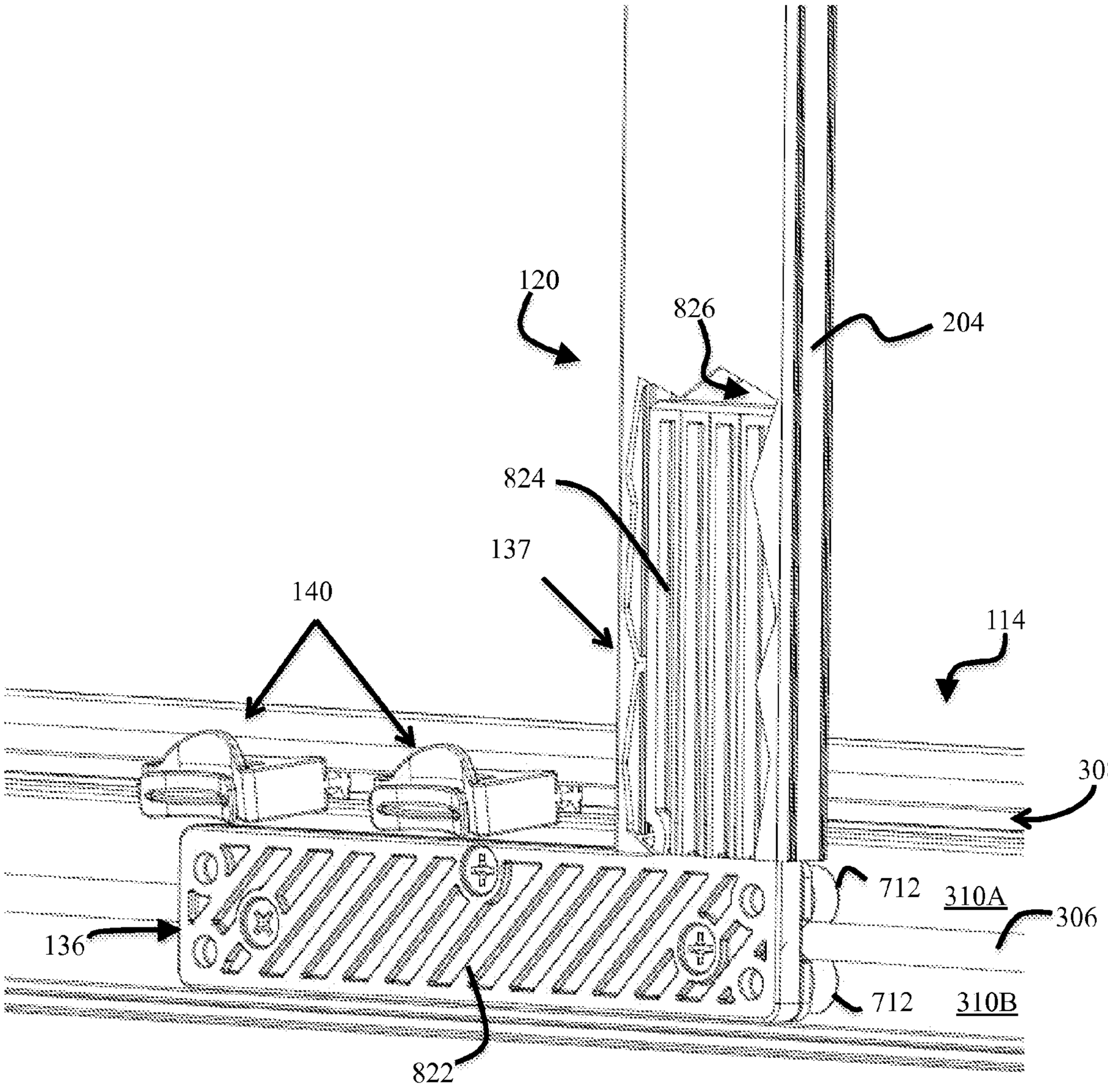


FIG. 8C

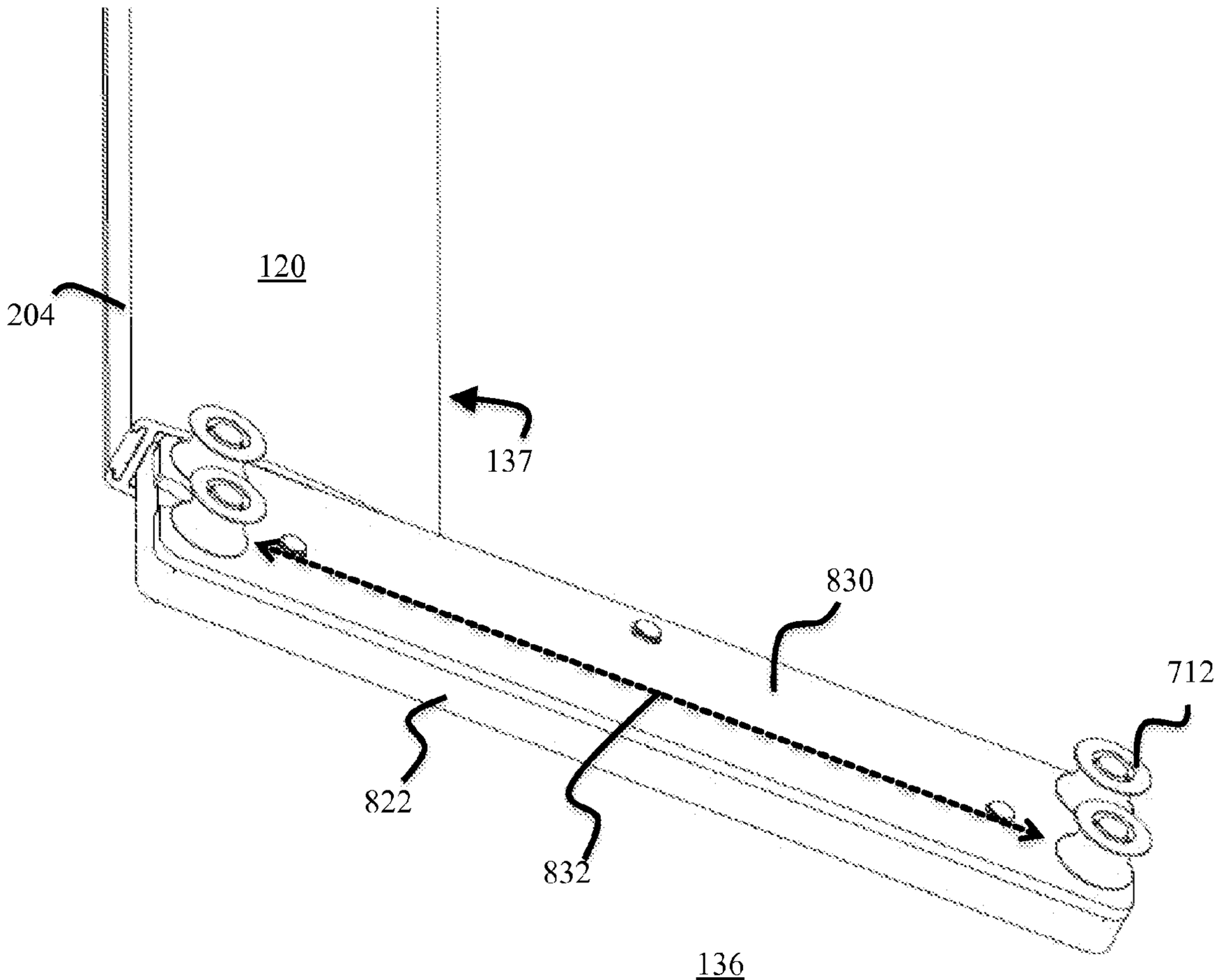


FIG. 8D

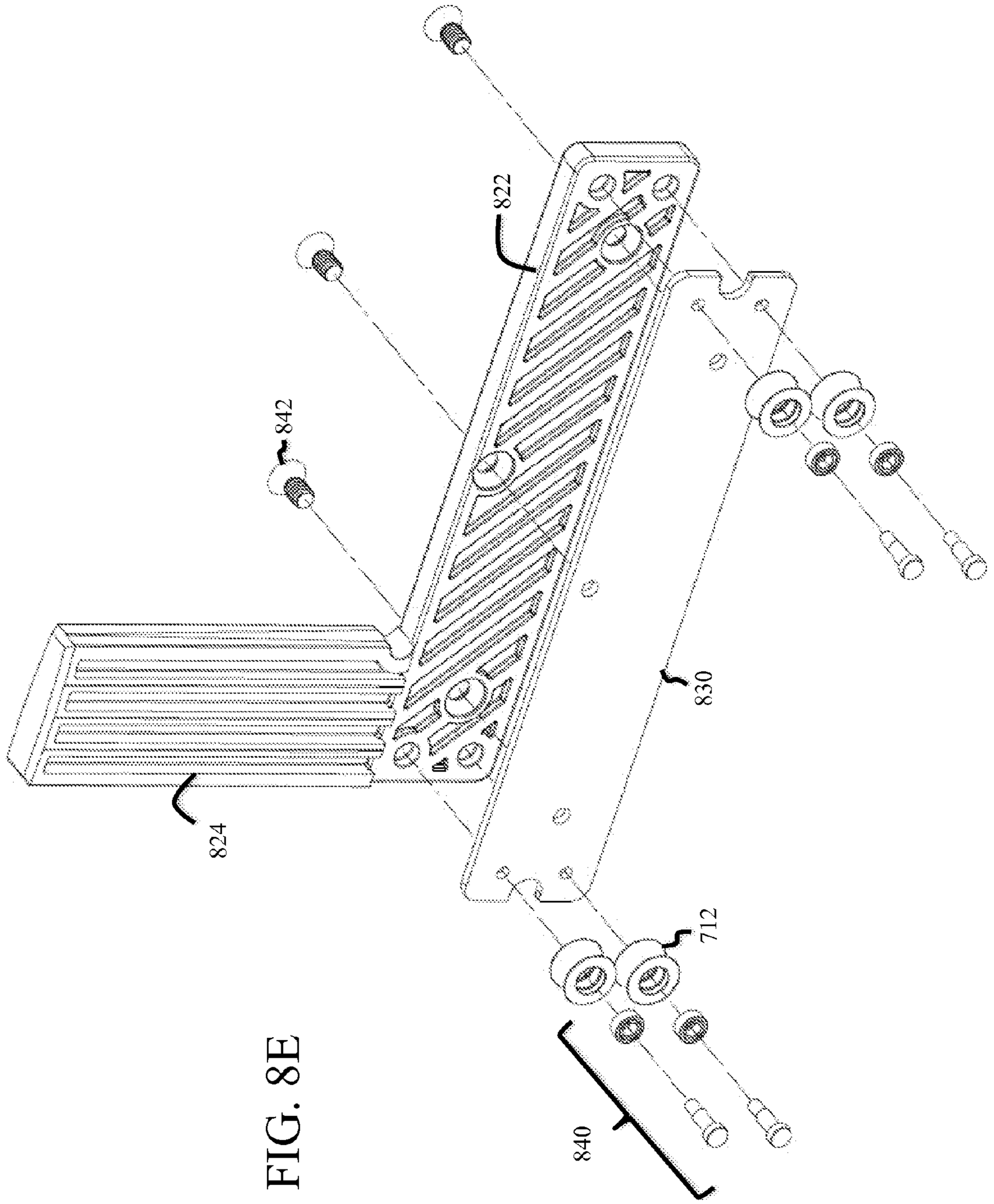


FIG. 8E

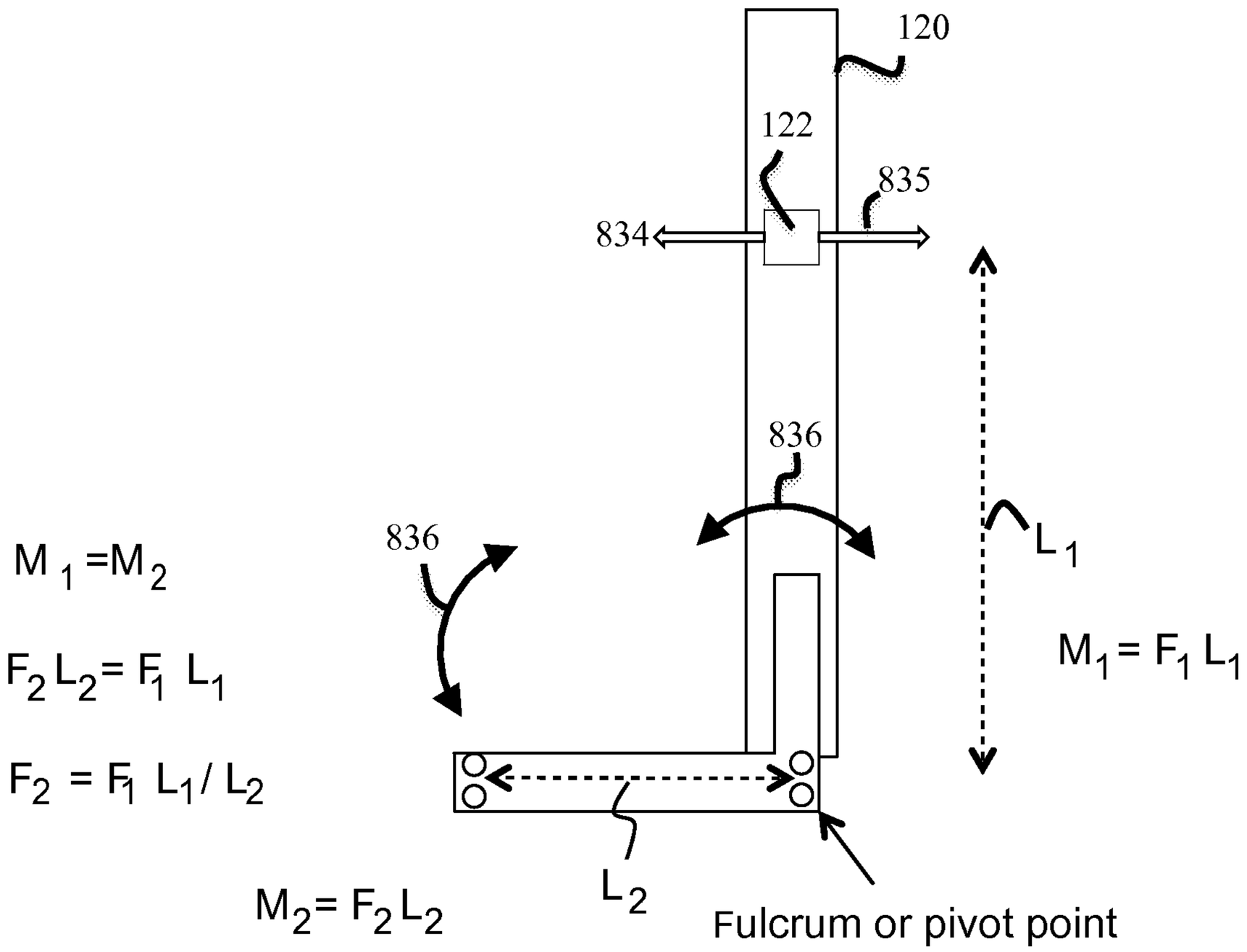

120
122
835
834
836
836
L_1
L_2
$M_1 = M_2$
$F_2 L_2 = F_1 L_1$
$F_2 = F_1 L_1 / L_2$
$M_1 = F_1 L_1$
$M_2 = F_2 L_2$
Fulcrum or pivot point

FIG. 8F

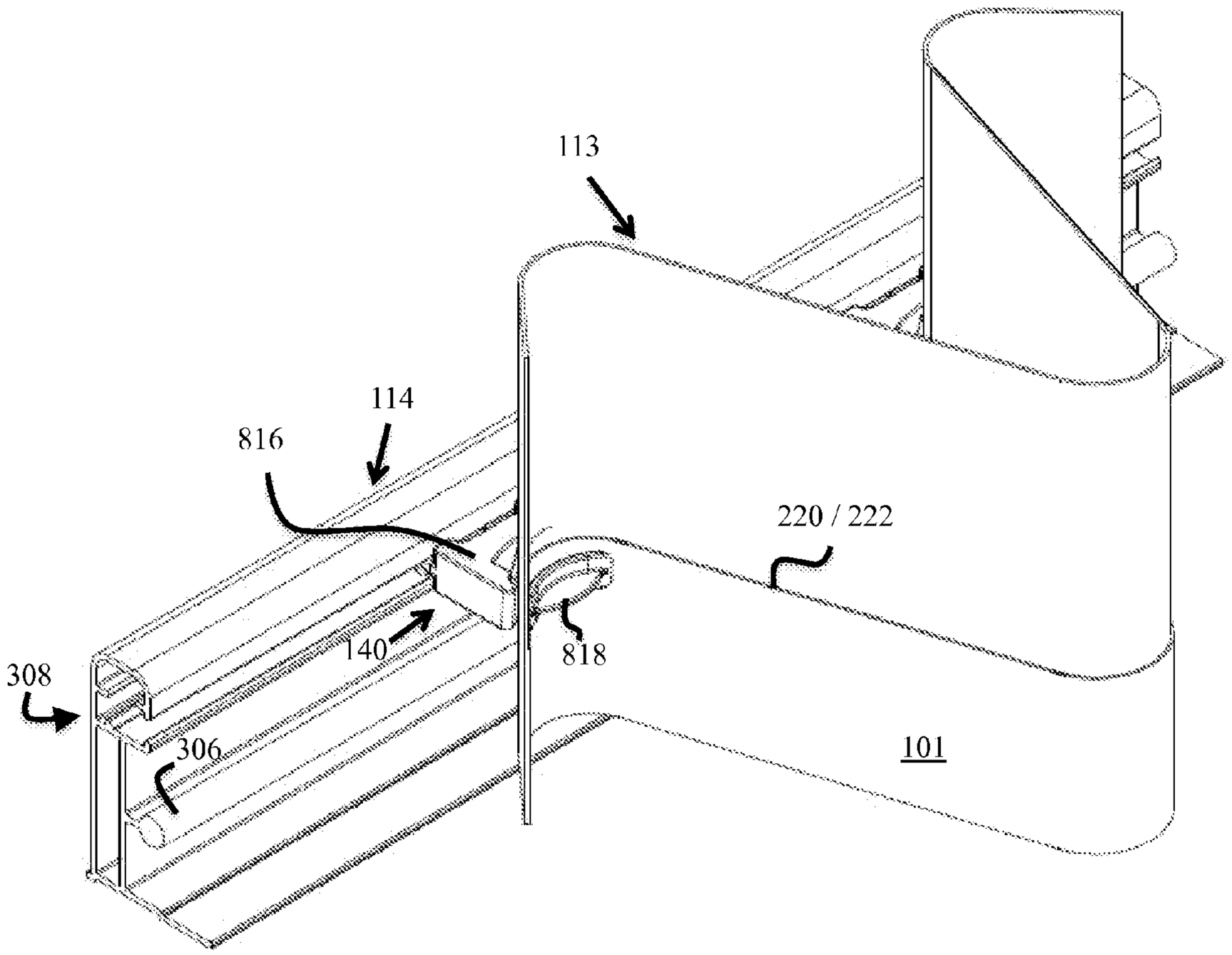


FIG. 9A

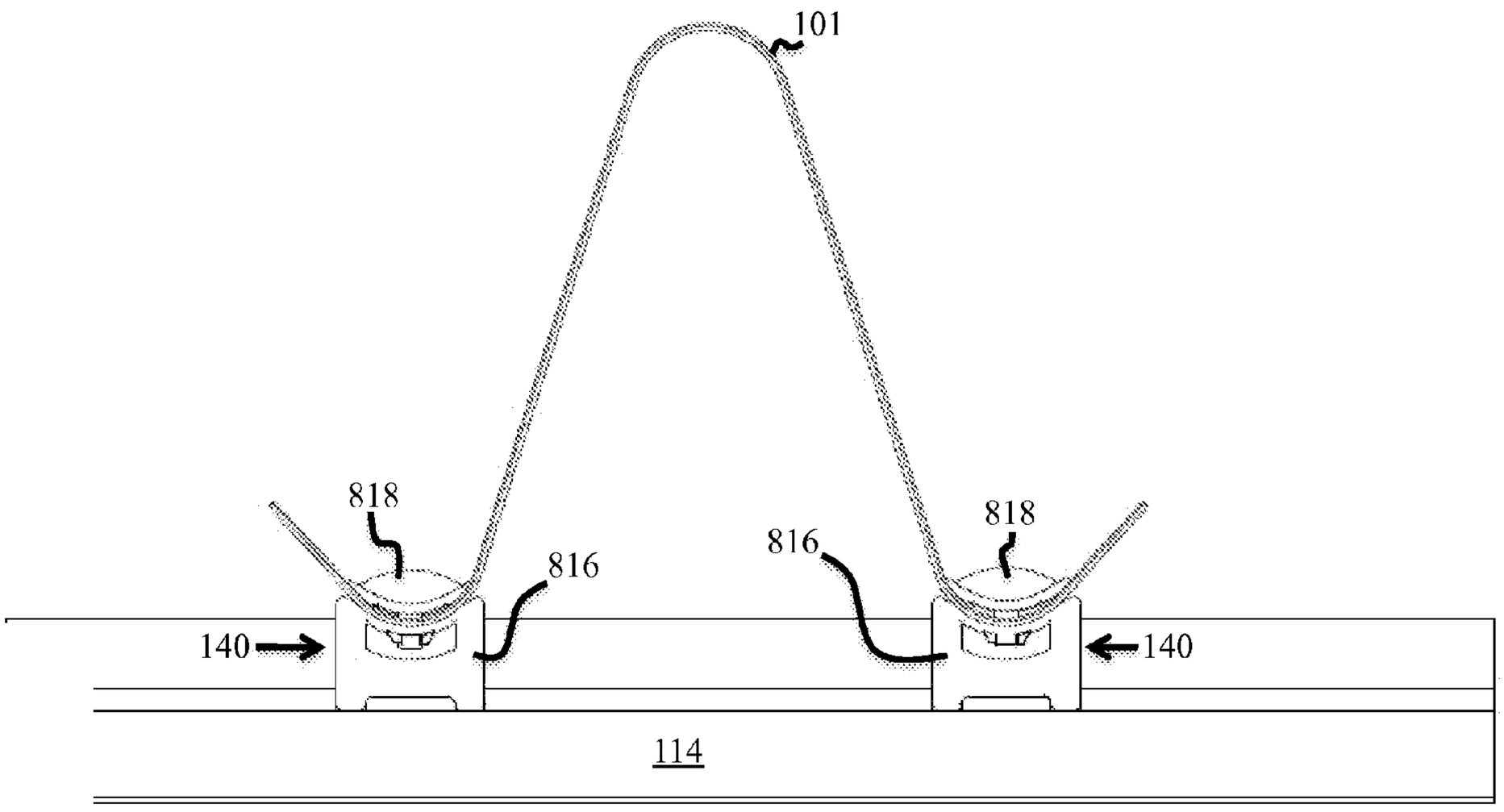


FIG. 9B

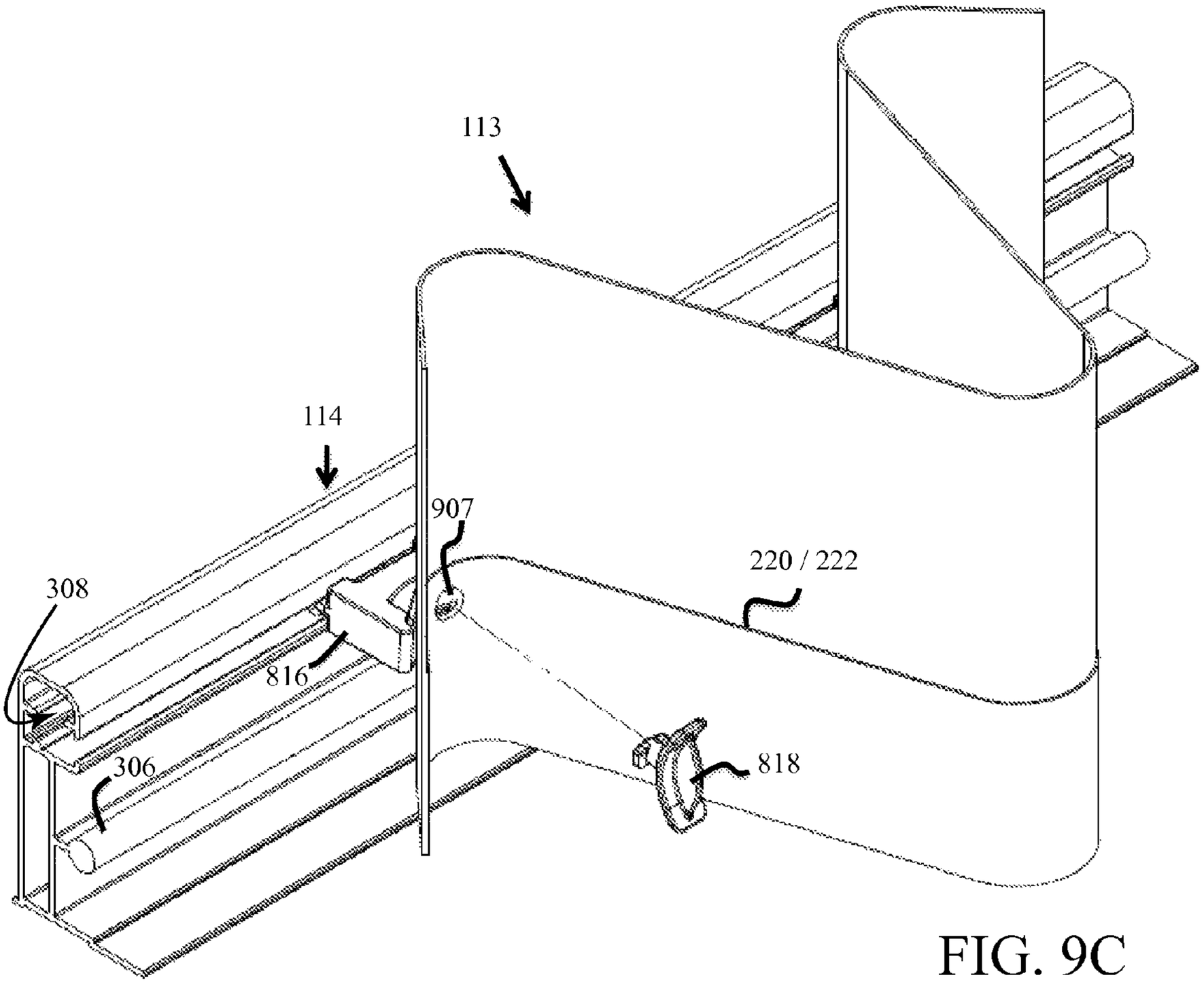


FIG. 9C

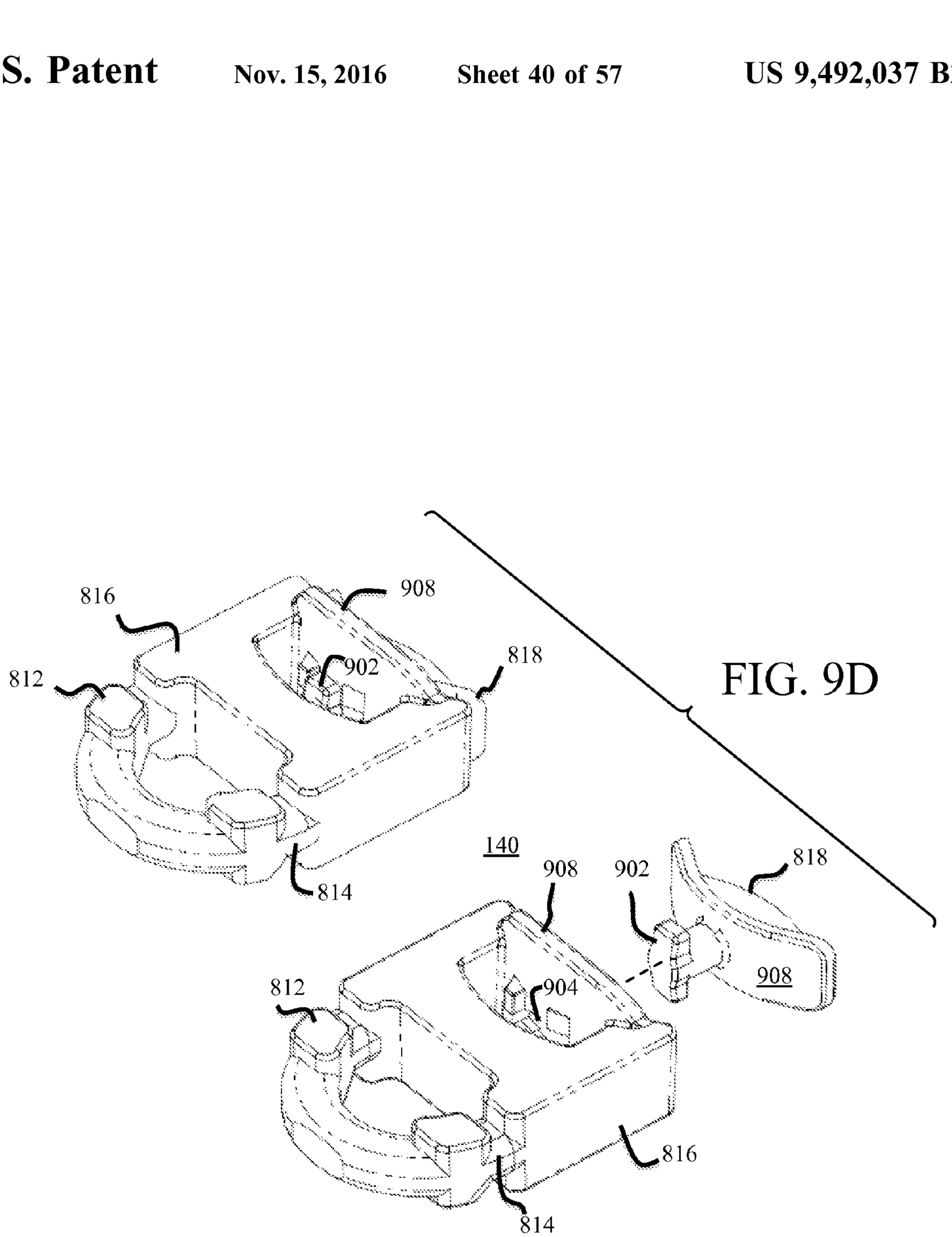


FIG. 9D

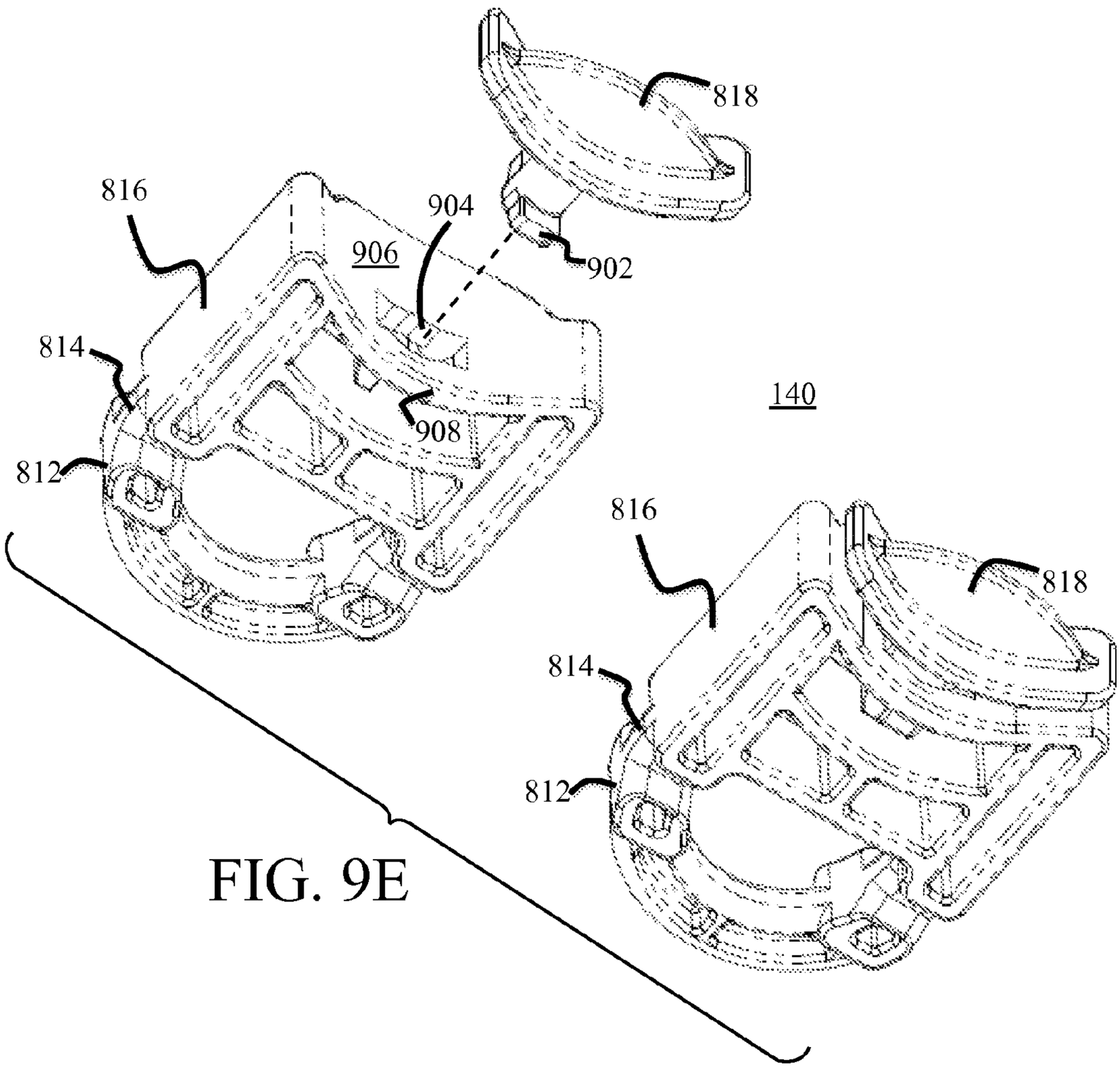


FIG. 9E

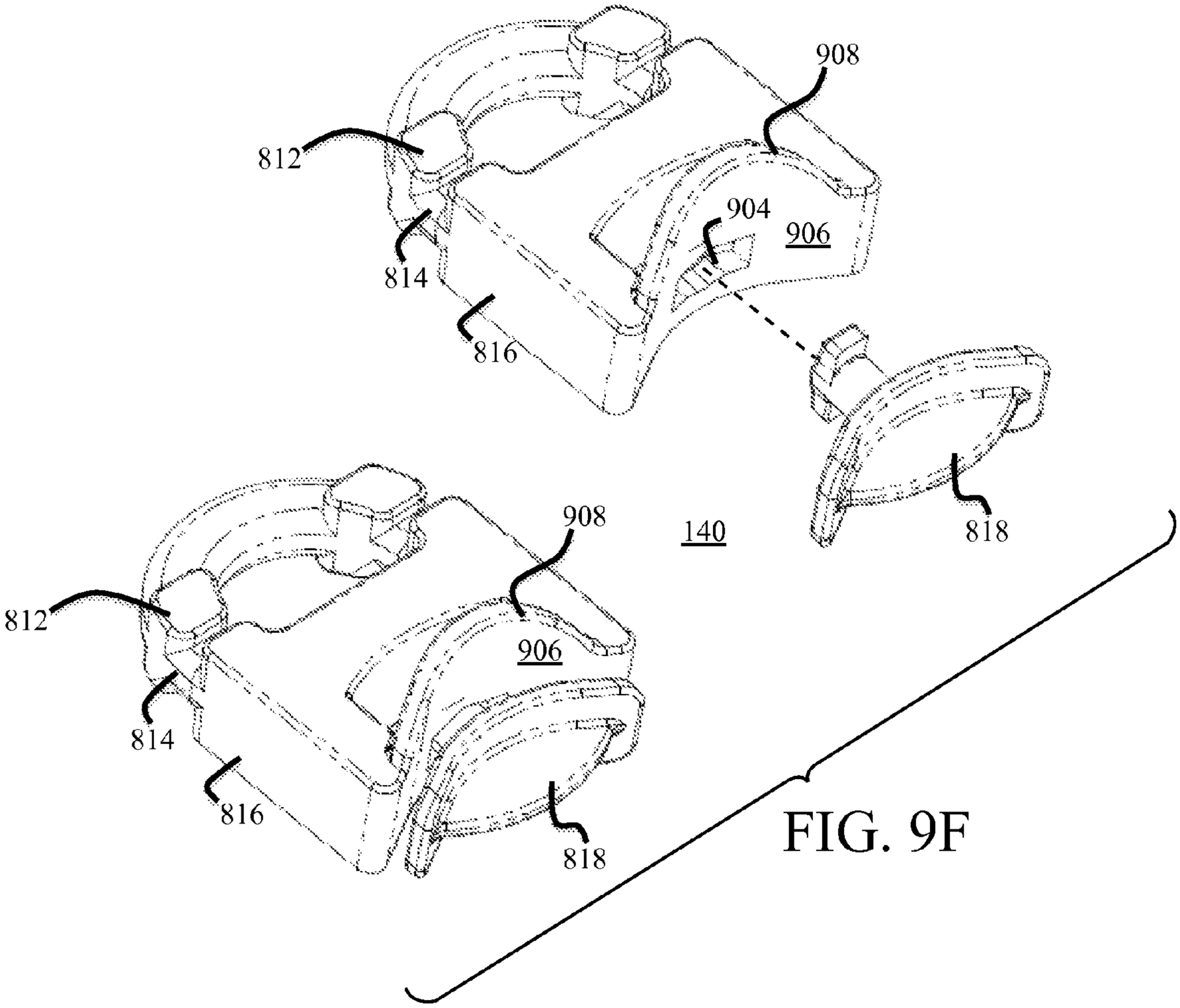


FIG. 9F

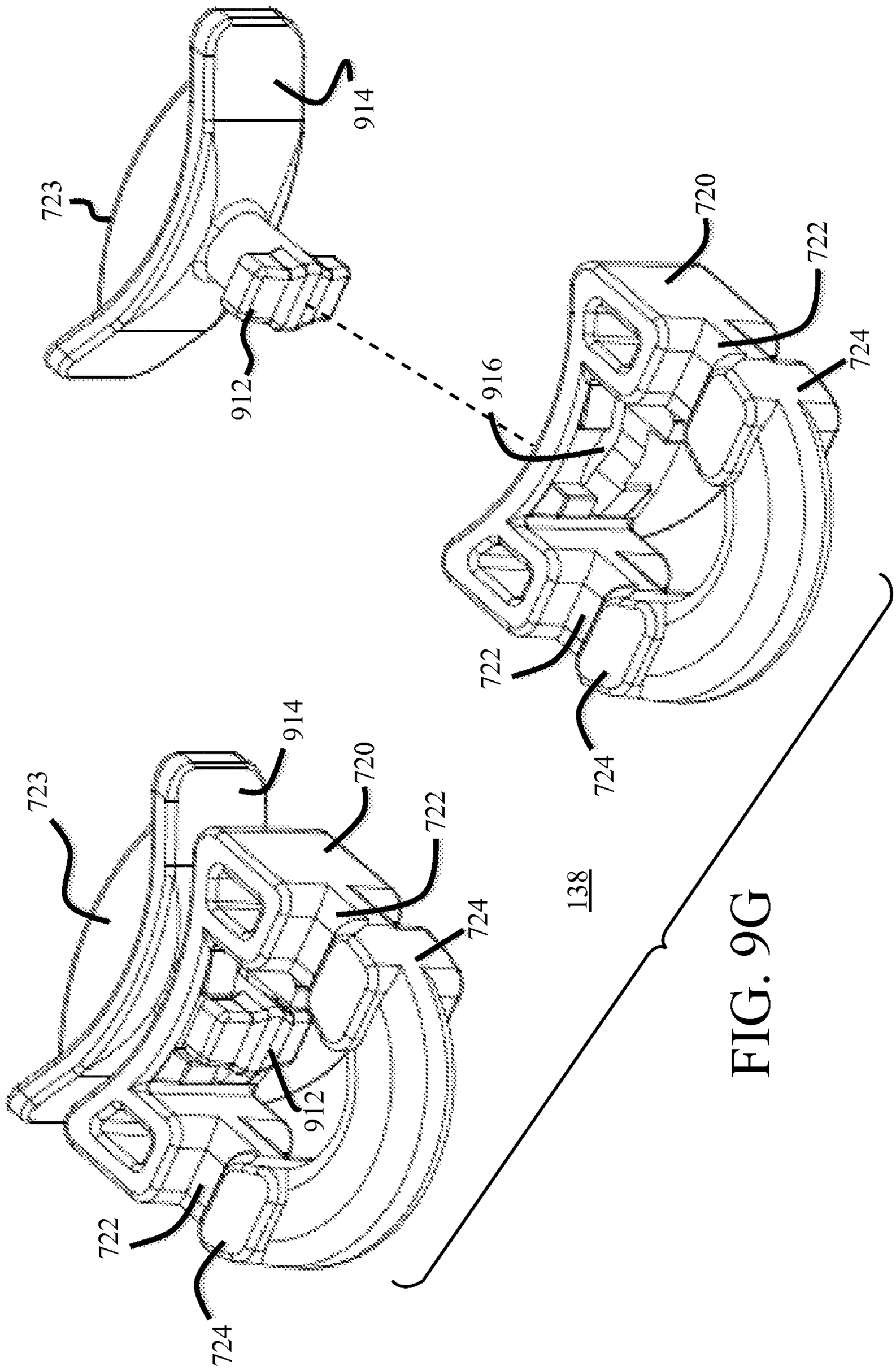


FIG. 9G

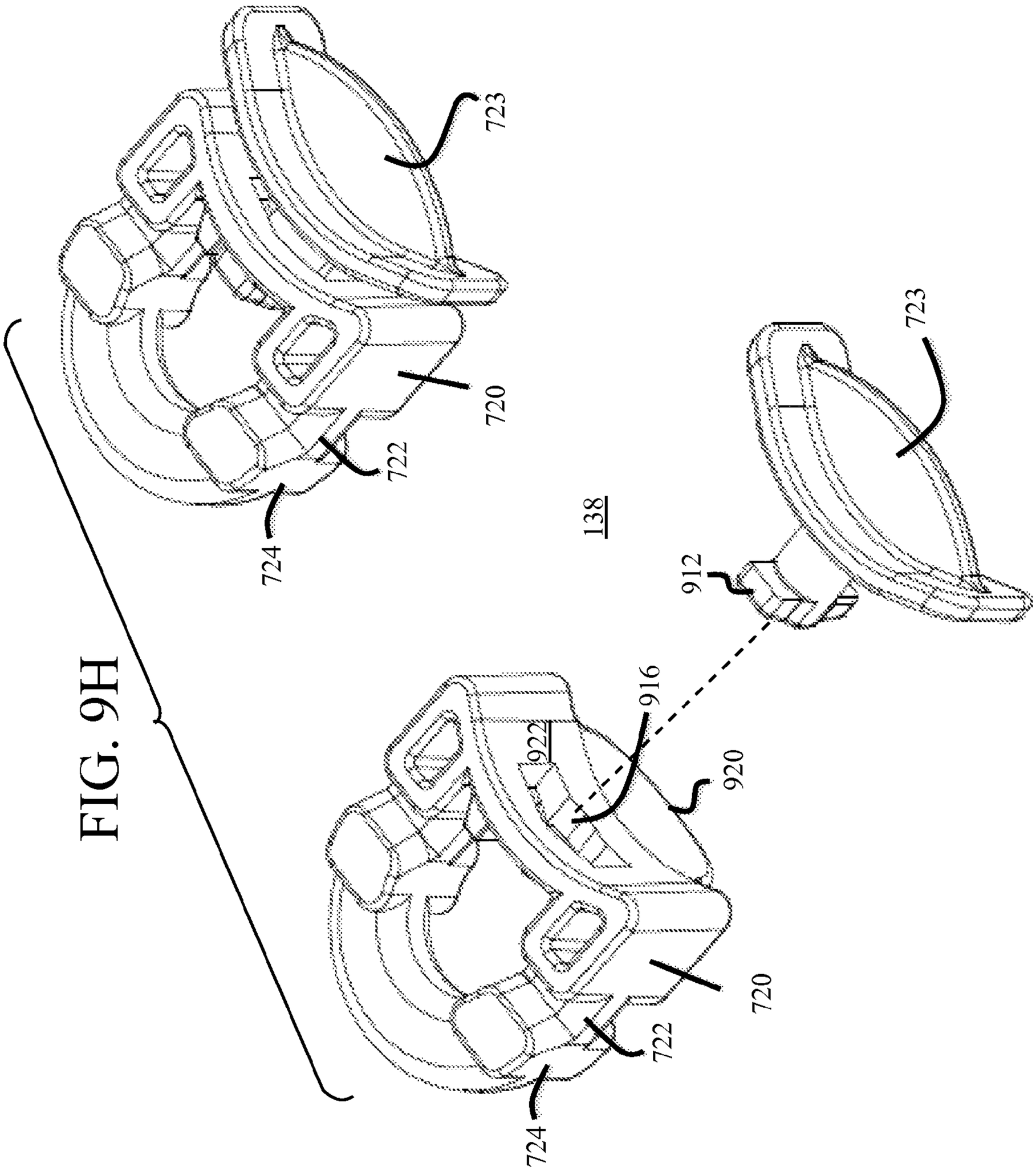


FIG. 9H

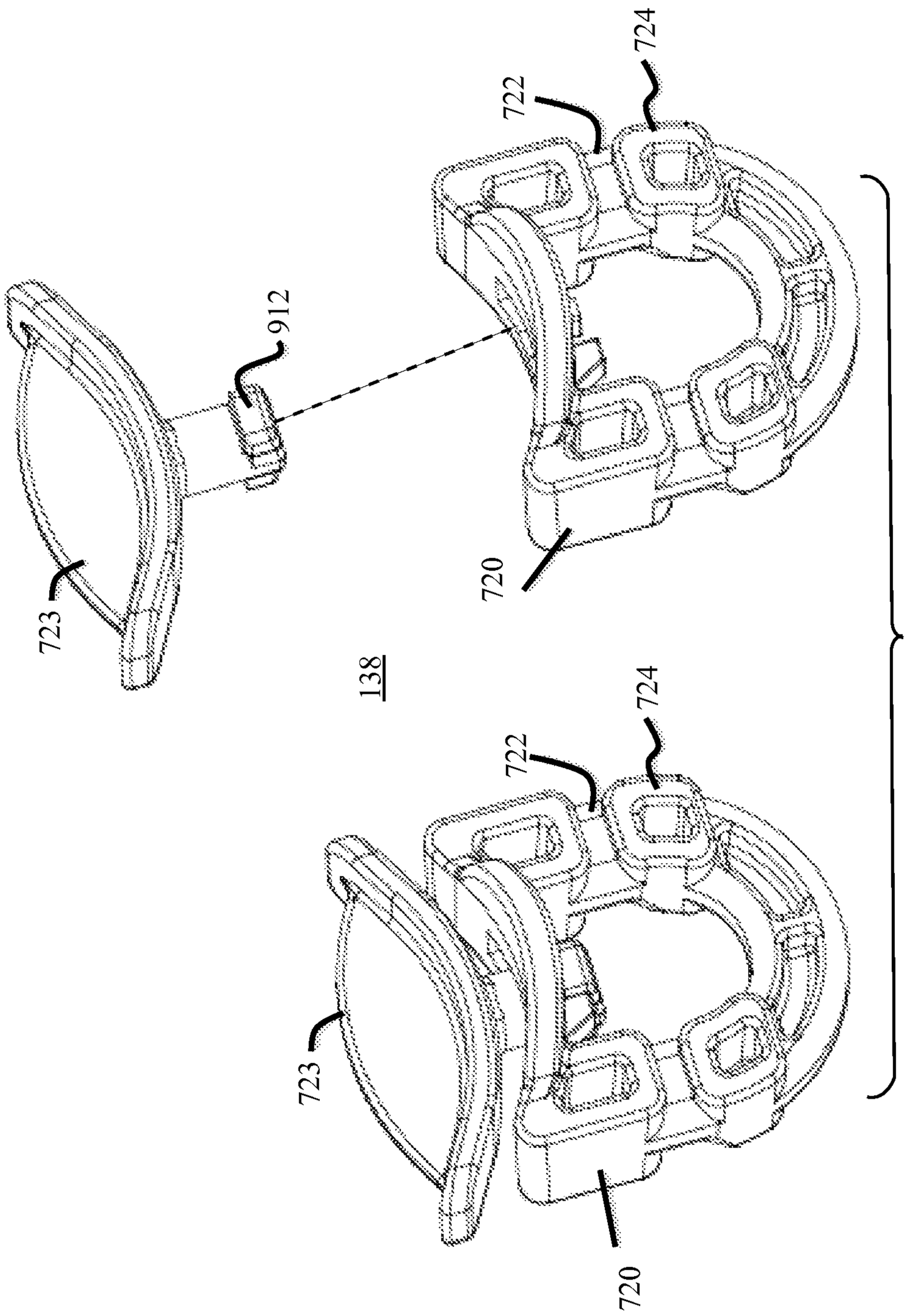


FIG. 9I

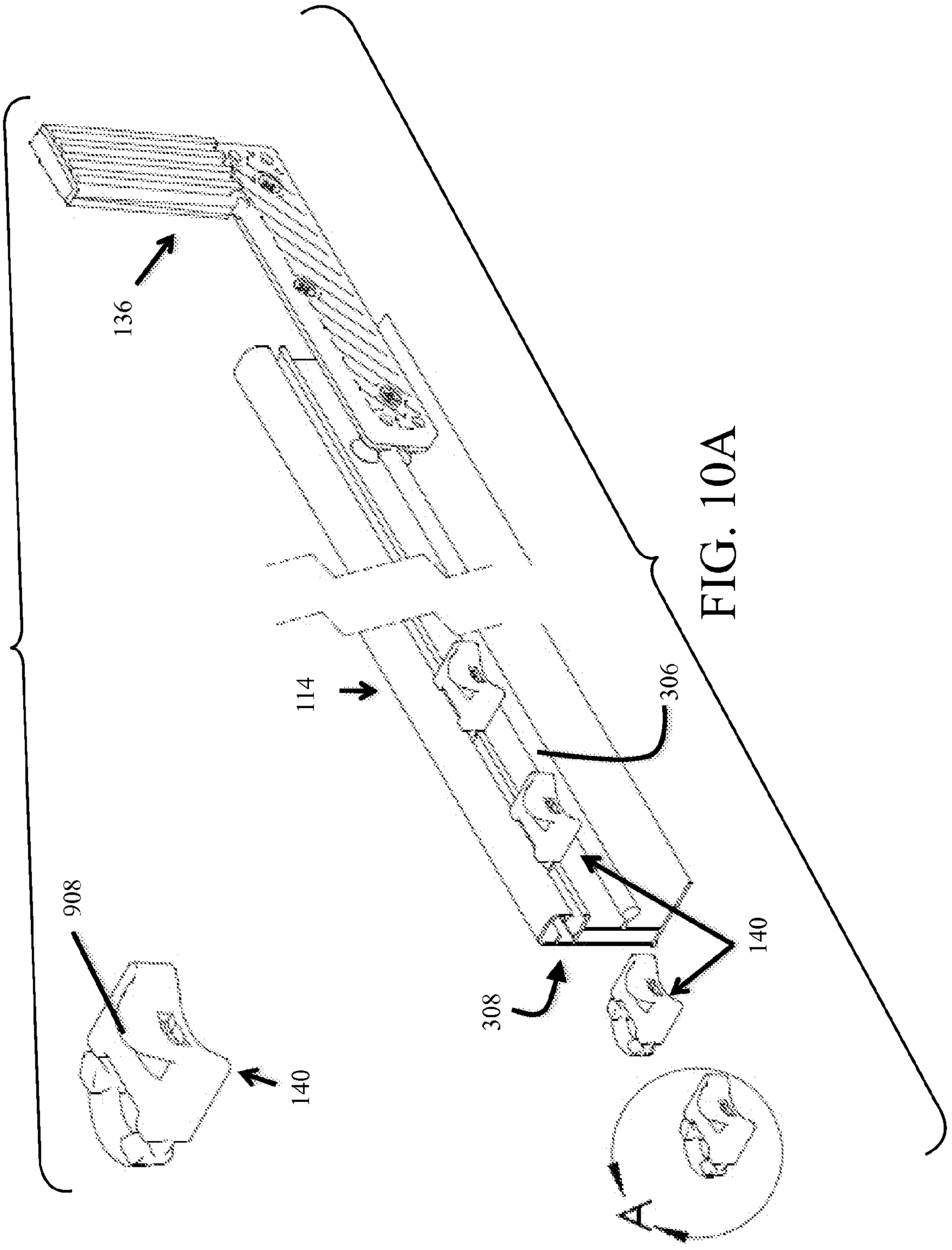


FIG. 10A

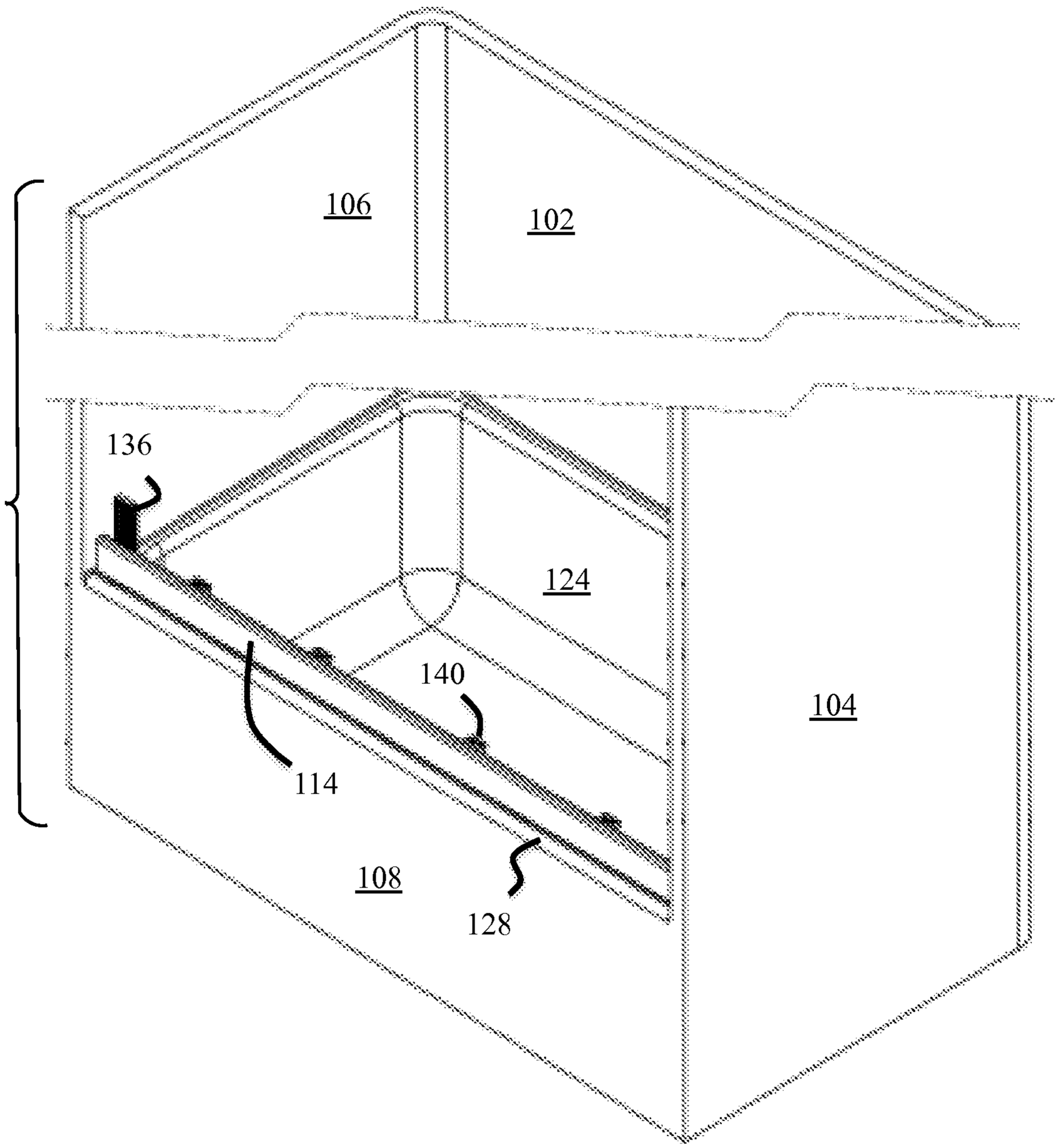


FIG. 10B

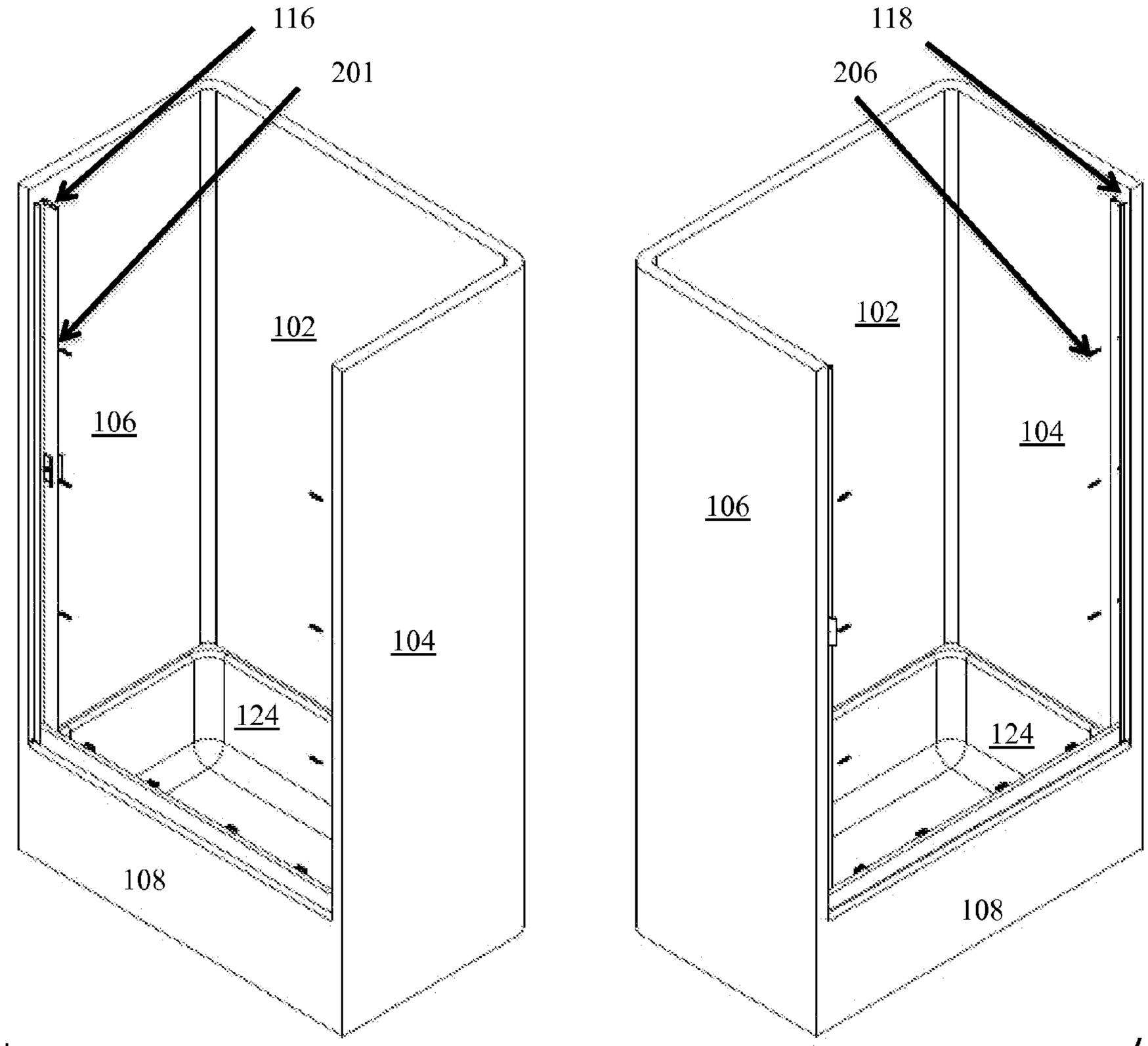


FIG. 10C

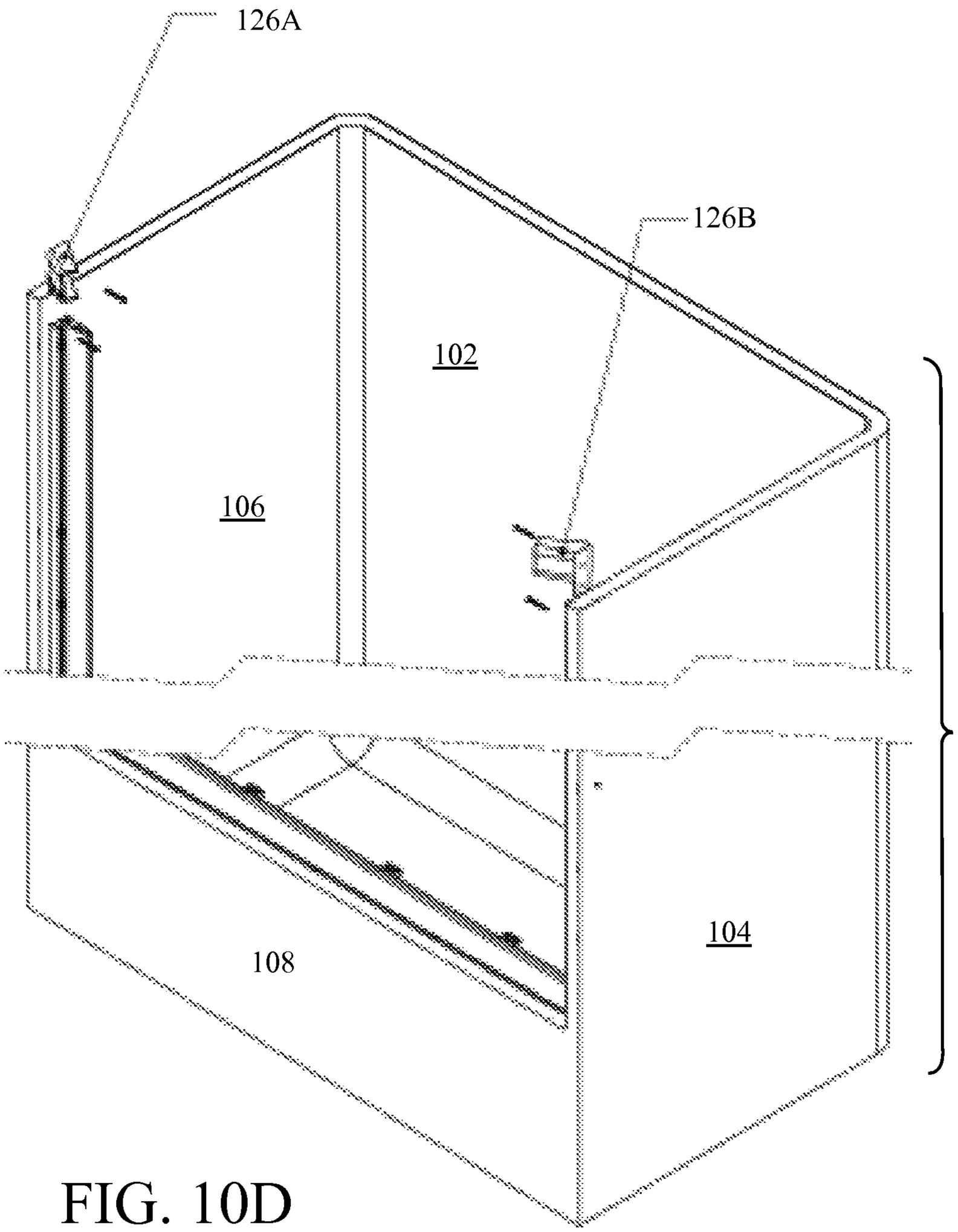


FIG. 10D

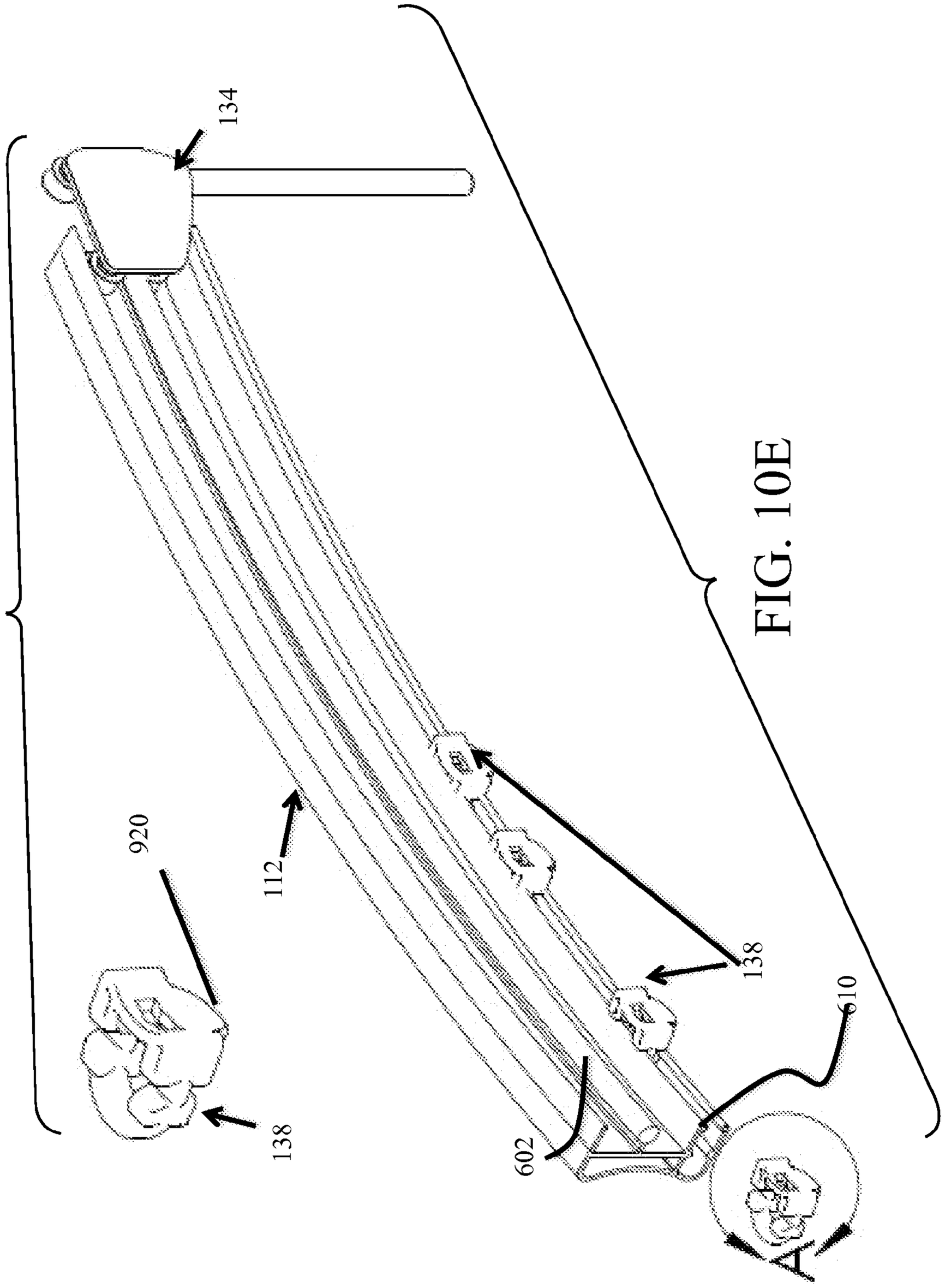


FIG. 10E

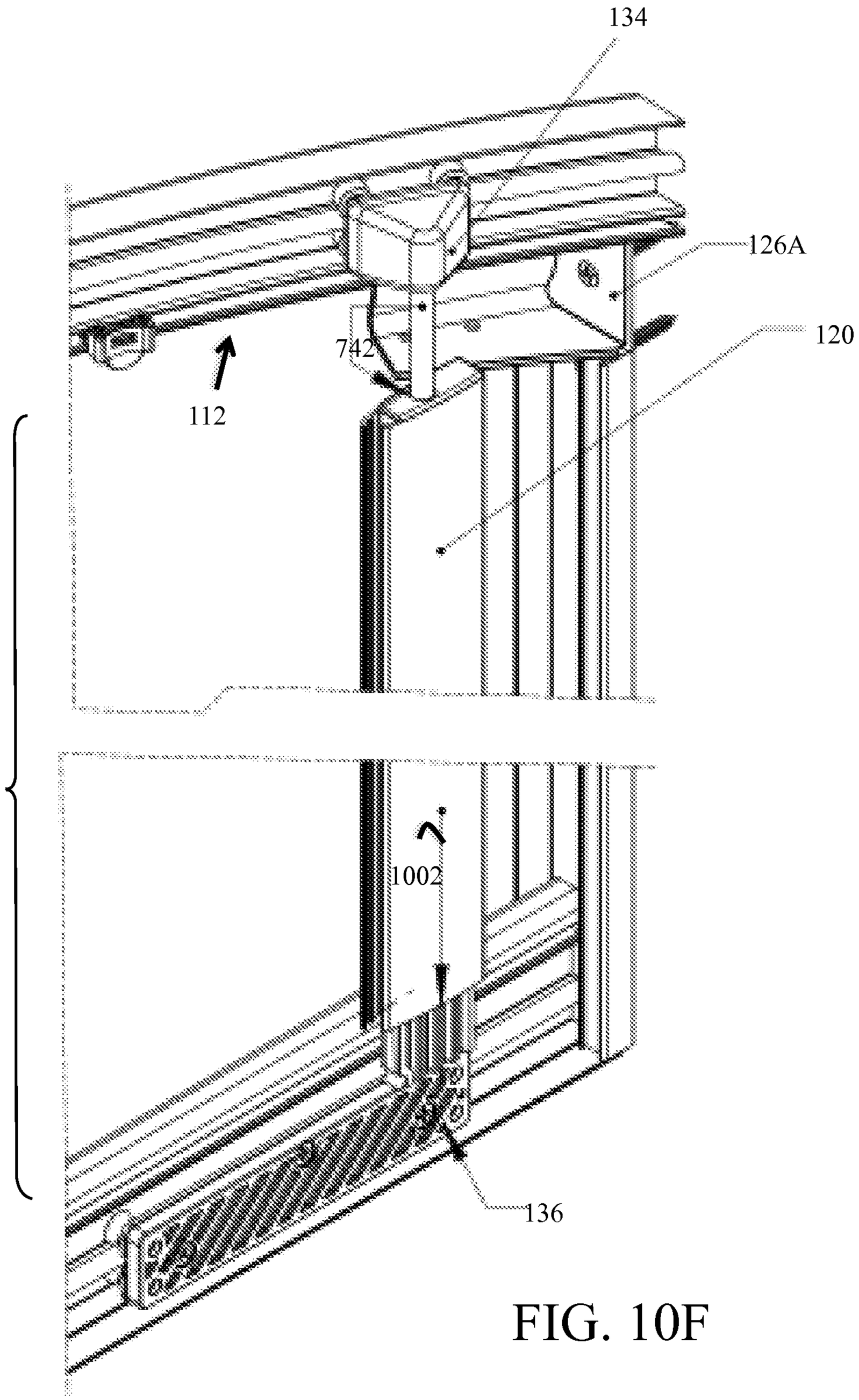


FIG. 10F

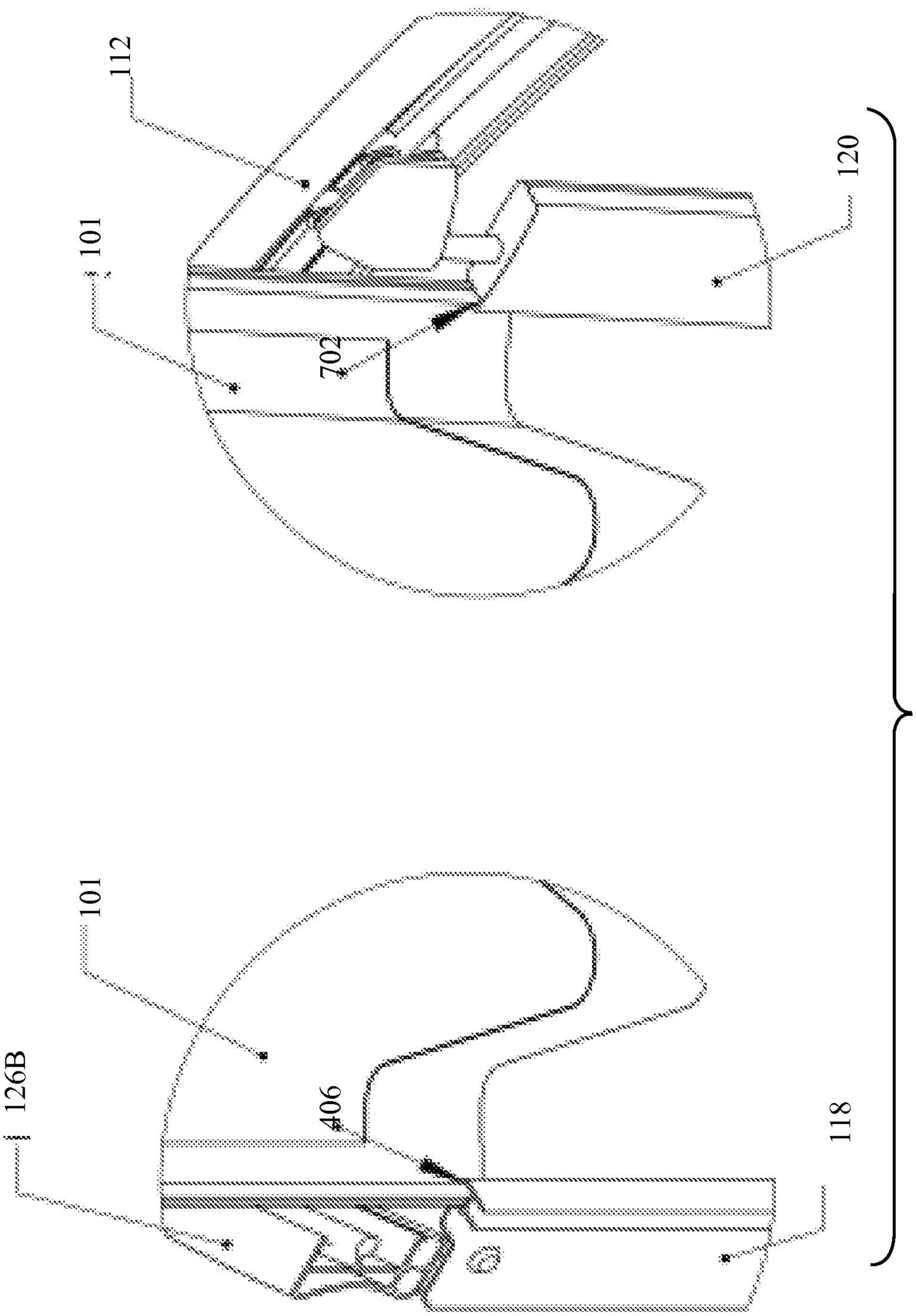


FIG. 10G

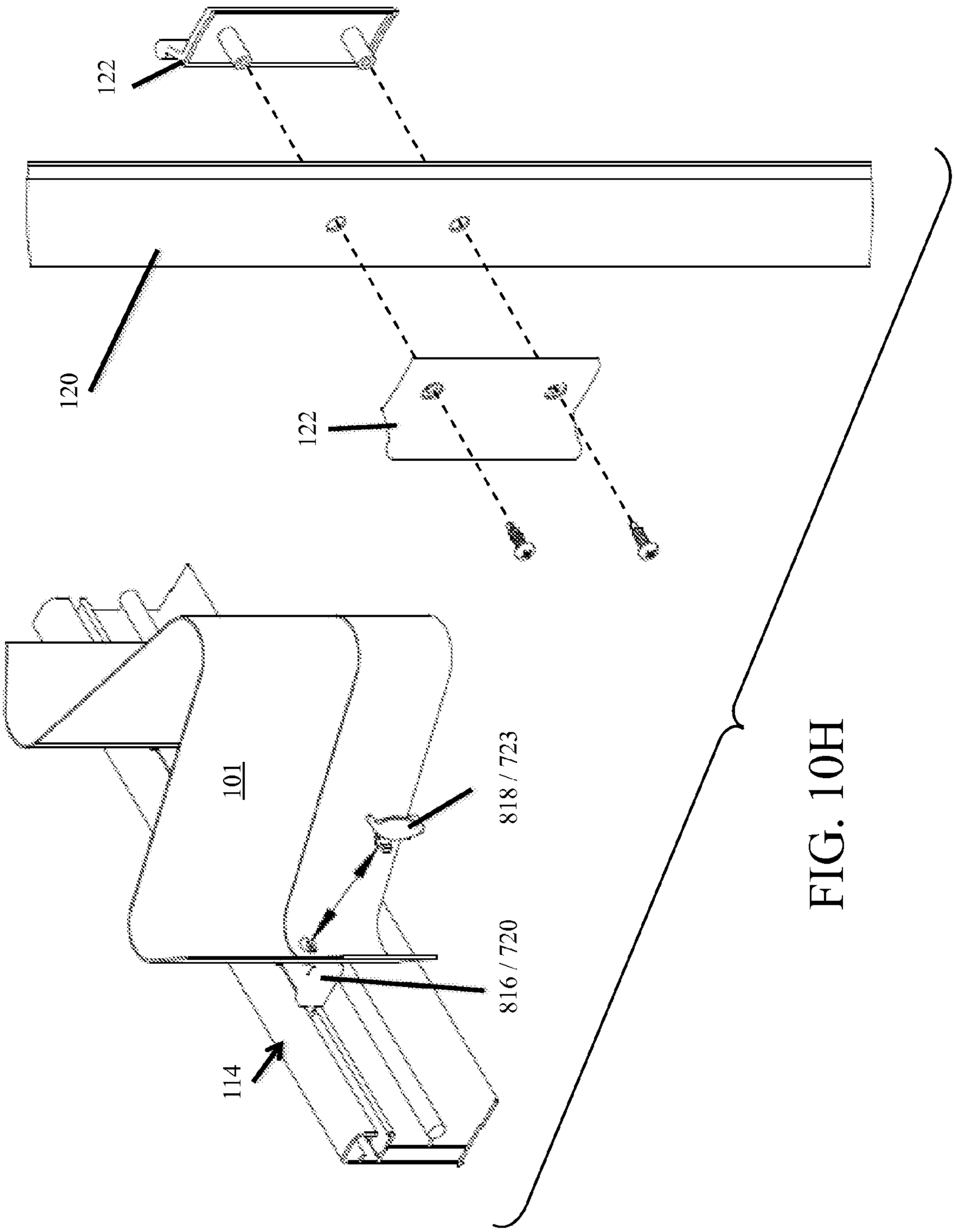


FIG. 10H

FIG. 11A

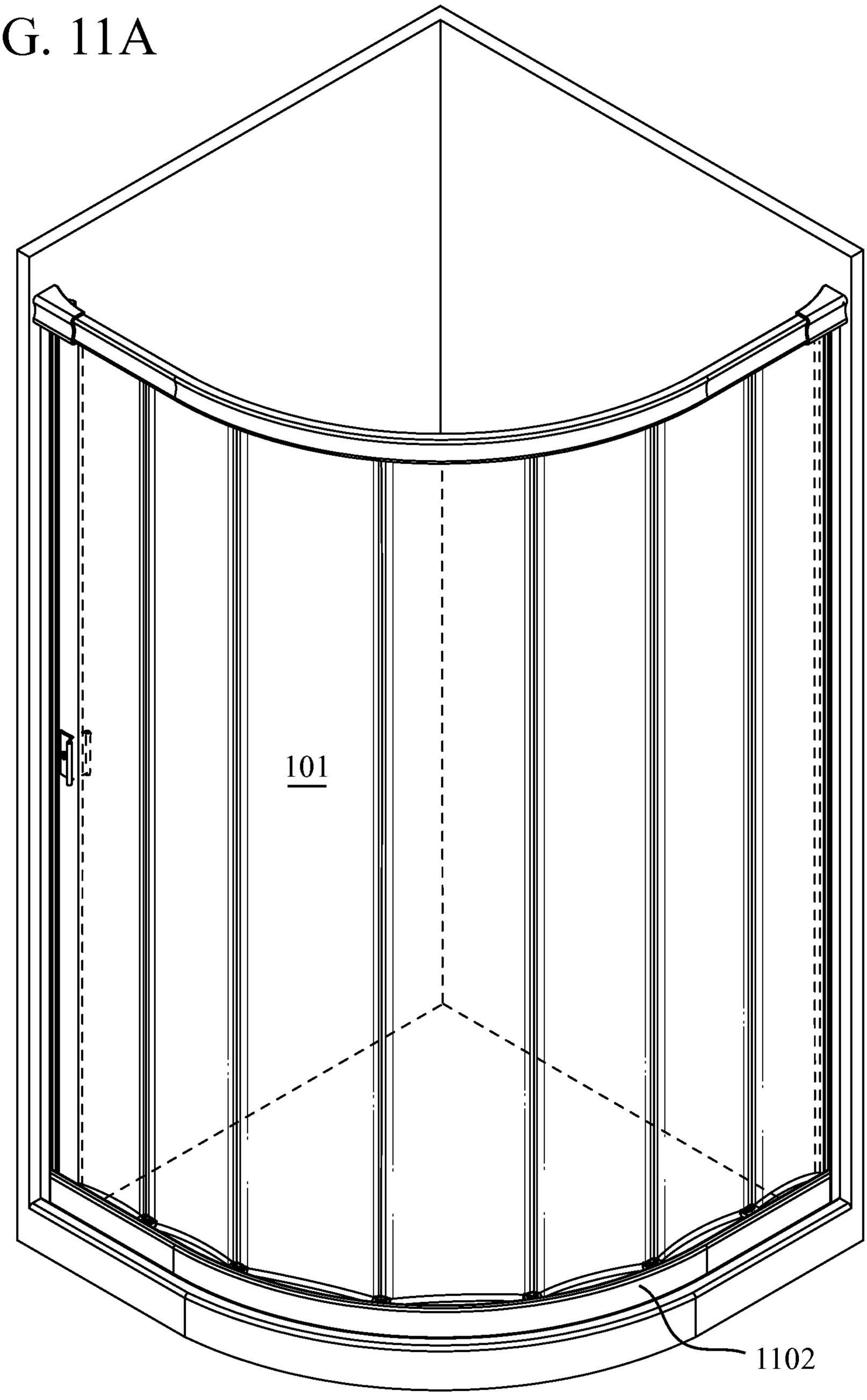


FIG. 11B

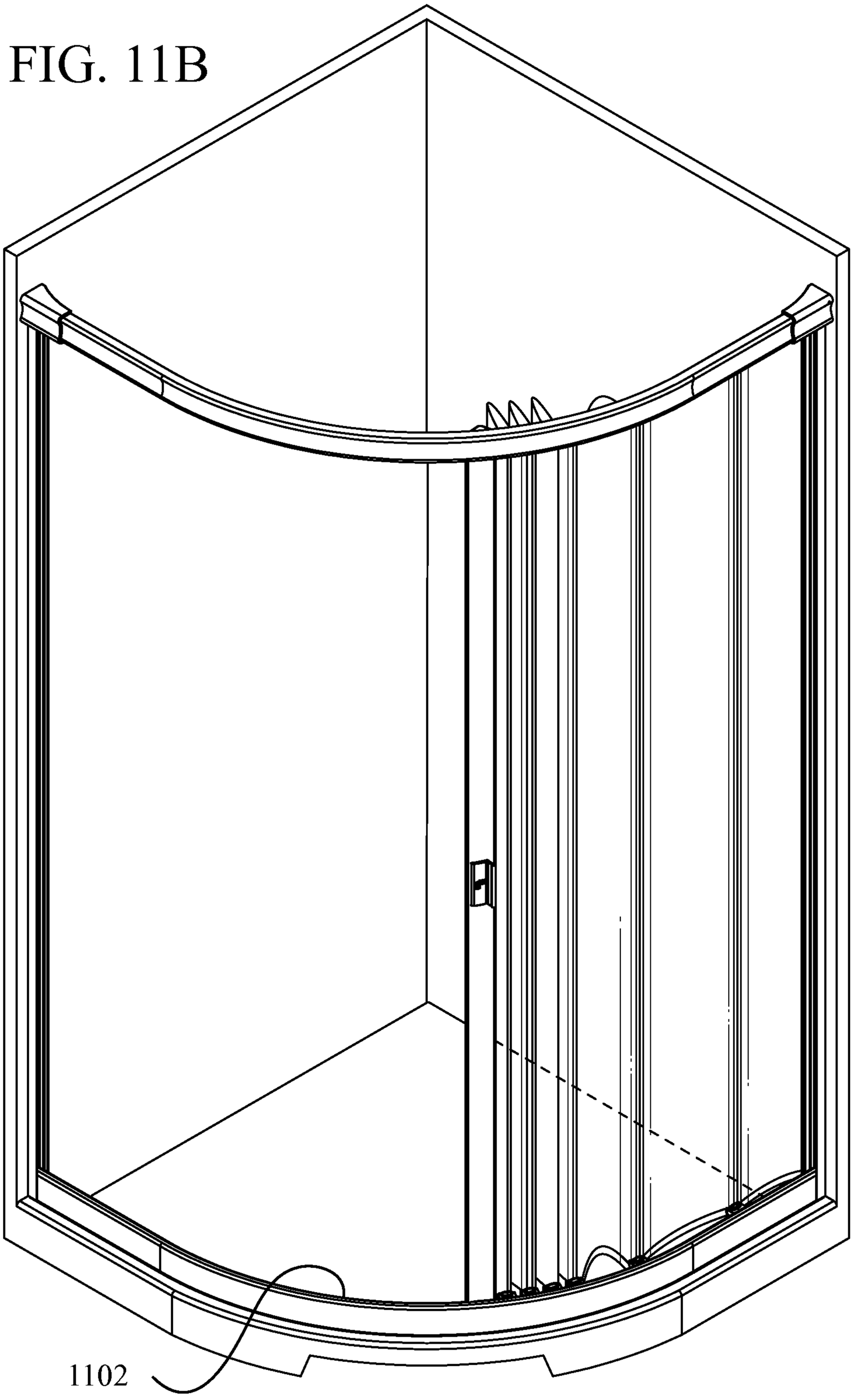
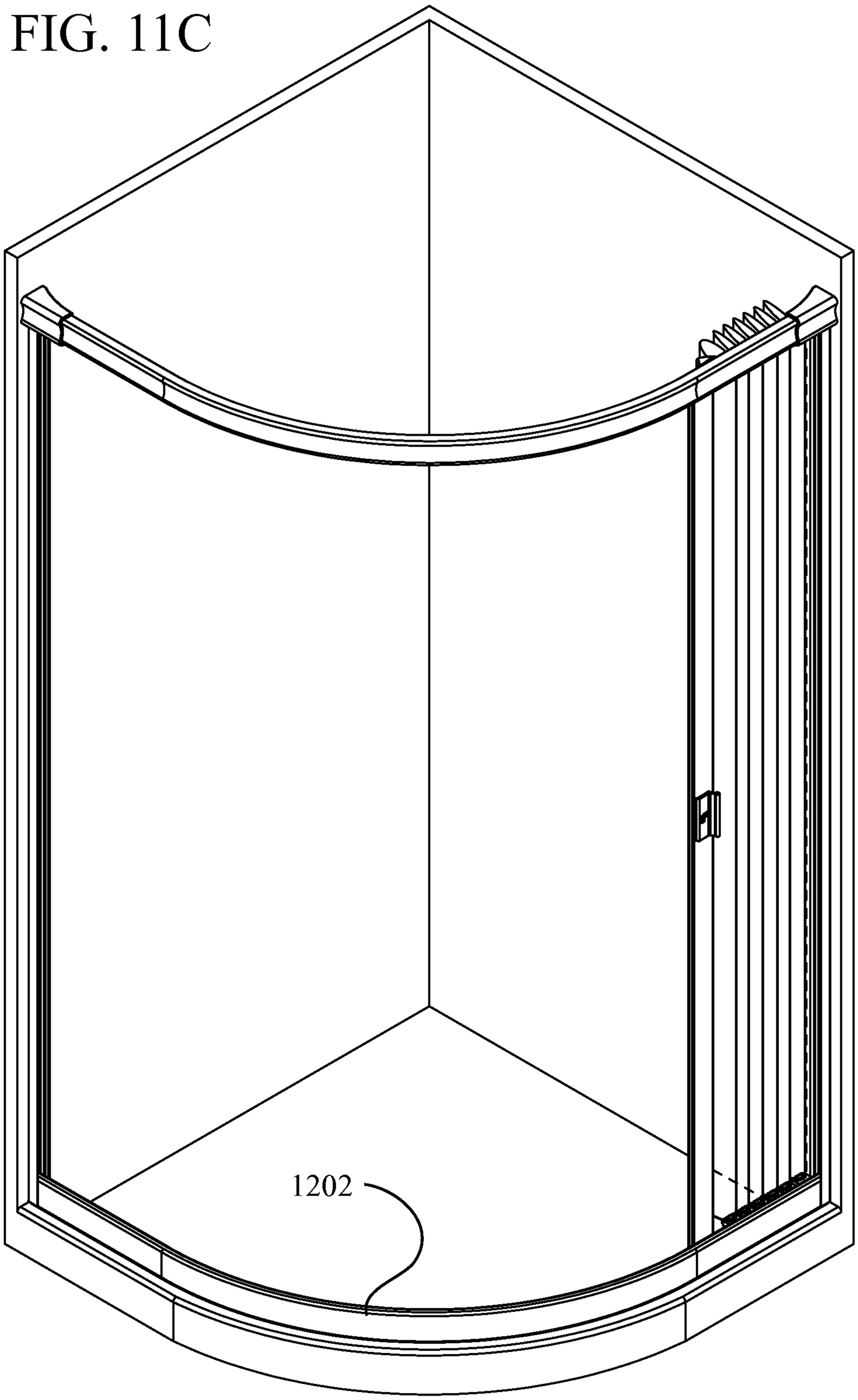


FIG. 11C



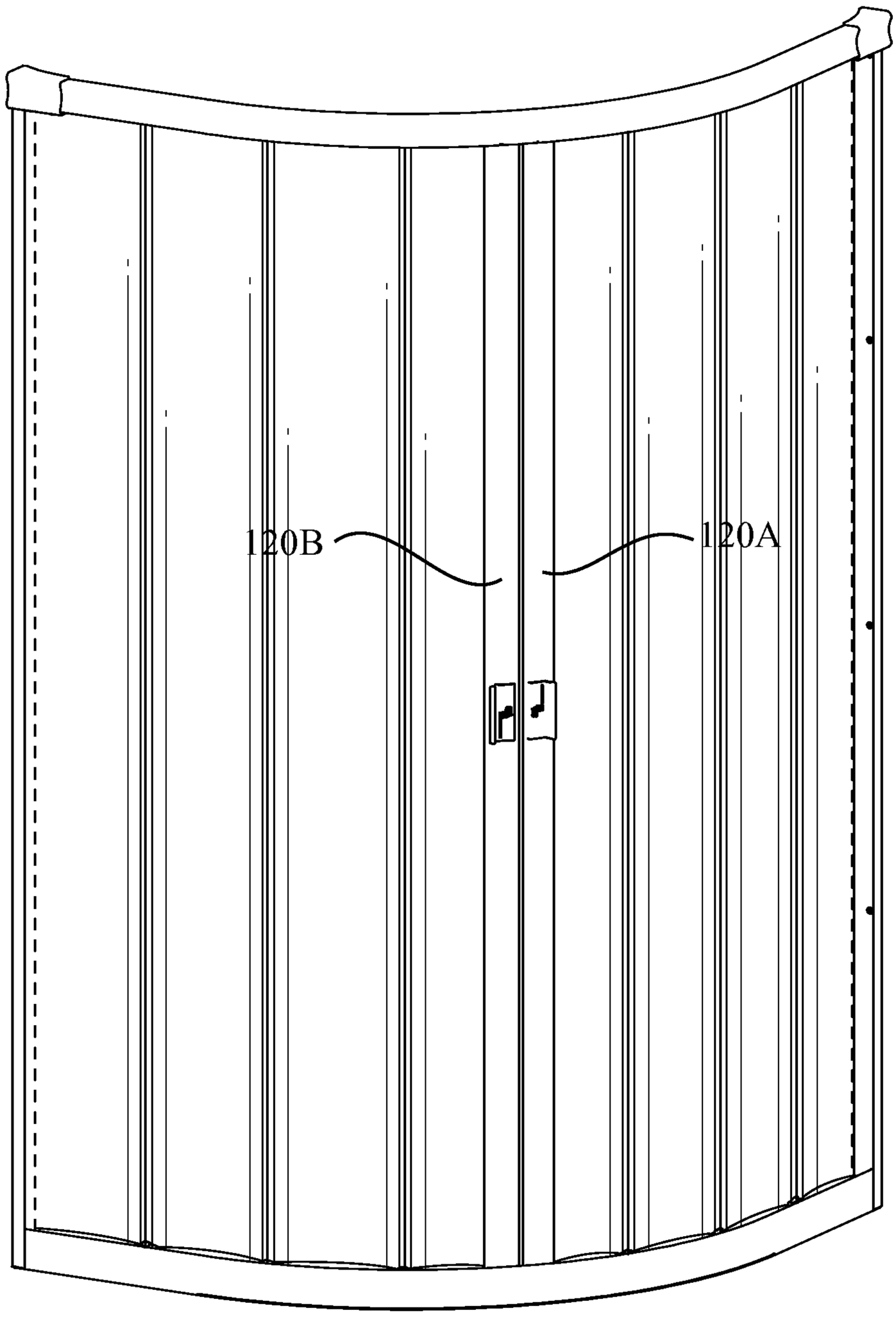


FIG. 12

HYBRID ENCLOSURE SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of priority of the co-pending U.S. Utility Provisional Patent Application No. 61/254,390, filed 23 Oct. 2009, the entire disclosures of which is expressly incorporated by reference in its entirety herein.

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to enclosures, and more particularly, to a hybrid enclosure system that increases the volume of usable space, increases ingress into and egress out of the usable space, and reliably retains and confines water within a shower area (if used as a hybrid shower enclosure).

Description of Related Art

Traditionally, shower enclosures have consisted of either soft or rigid enclosures. The soft enclosures are primarily comprised of a shower curtain (a flexible cloth and/or plastic) in connection with a curtain rod and a sliding feature that allows the curtain to slide open/closed. The rigid enclosures are primarily comprised of glass or rigid plastic, usually using aluminum/plastic extrusions to hold various rigid glass panels together and made to retain water using silicone sealant.

Usage of conventional soft enclosures with shower curtains offers a very low cost option to enclose a shower area. One major drawback to the shower curtain construction is that they are very susceptible to leakage of water outside of the shower space because they cannot and do not reliably close-off the shower area completely. Of course, this is due in part to the well-known Bernoulli's principle, where an increase in the speed of the fluid occurs simultaneously with a decrease in pressure or a decrease in the fluid's potential energy. That is, water speeding out of the showerhead creates a lower pressure inside the shower space defined by the enclosed shower curtain, compared to the outside. This air pressure differential causes the outside higher air pressure to push the curtain enclosure towards the source and cause of the lower air pressure inside the shower space, which is the speeding water existing the showerhead. According, since nothing physically connects the side and or bottom edges of the curtain enclosure to the tub or wall(s) or some other physical structure, the curtain moves towards inside the shower space. In other words, when the bottom and or sides of the curtain remain loose (i.e., unattached), the loose curtain will be susceptible to moving away from the walls or the curb of the tub/shower due to the air pressure differential on either side of the curtain. This movement may even result in the curtain moving toward the user of the shower, with the curtain even sticking to the person's body. This movement of the curtain away from the walls or curb of the tub/shower creates an opening for the water to leak, and not remain within the confine of the shower space. With the curtain able to move in any direction before, during, and after a shower, water is easily allowed to pass into the non-shower space, resulting in creation of a slippery surface, which can lead to water damage. Some attempts have been made to improve problems associated with leakage of water, for example, by sewing magnets or weights into the bottom corner of the curtain so that the curtain can stay within the tub, but water continues to leak out through the lateral vertical sides of the curtain.

The drawback with the usage of conventional rigid enclosures with glass panels with in-line or pivot doors is that rigid enclosures limit access, and narrow ingress into and egress out of the shower space. Most often, rigid enclosures such as glass shower enclosures have portions of their assembly or structures encroach into the potential ingress/egress area of the shower. This is always the case with in-line shower enclosures or sliding door applications. In-line shower enclosure may include bypassing doors that slide and bypass one another or may include one fixed panel on one side with an operating sliding door on the other side that slides and bypasses the fixed panel. In most in-line shower enclosures, the sliding door(s) and or the fixed panel with the sliding door are made slightly larger than one-half the total access space of the shower area, which allows the structures to overlap so to prevent water leakage. However, the result of the overlap is that the access to the shower area is reduced to about less than 40 percent, with over half blocked by either the fixed panel and or the sliding doors due to the overlapping feature.

For pivot door applications, there is generally a door that rotates out from the closed position, most commonly outward away from the shower space and toward the inside of a room. In the recreational vehicle (RV) industry where bathroom areas are minimal, pivot doors are generally not used. In addition, in the RV industry, rigid-type shower enclosures such as glass are generally also not used due to their weight, which, if used, generally result in higher gasoline cost for the operation of the RV. Accordingly, in most instances, in-line enclosures are generally preferred over pivot door applications.

Recent trends in new designs for soft shower enclosures change the curtain rod design to allow the basic enclosure to extend beyond the shower space by a curved curtain rod. This recent trend in shower enclosure designs has encouraged the increase in usable shower space by extending the curtain beyond the traditional confines of the traditionally defined shower area. This type of improvement has been introduced into the market with a curved shower rod used in connection with soft enclosures, such as a shower curtain. As indicated above, one major drawback to the shower curtain construction with or without this curved improvement is that they continue to be very susceptible to leakage of water outside of the shower space. As for the rigid-type enclosures, since conventional glass panels are solid and flat, they cannot and do not extend beyond the traditional shower space, and remain confined therein. Therefore, they cannot and do not extend or increase the showering area or space.

Accordingly, in light of the current state of the art and the drawbacks to current shower enclosures mentioned above, a need exists for an enclosure system that would combine most of the beneficial features of the soft and rigid shower enclosures, but without their respective drawbacks. In addition, a need exists for a shower enclosure system that would further increase the usable shower space when fully closed, and increase access to and from the shower space when fully open.

BRIEF SUMMARY OF THE INVENTION

An exemplary aspect of the present invention provides a hybrid enclosure, comprising:

a flexible, lightweight cover coupled within a rigid frame and at least one rigid stile that functions to confine a space, with minimal structural encroachment into potential ingress and egress area of the space when fully open.

Another exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the frame includes:

a sill;

a header;

a first jamb and a second jamb coupled between the sill and the header at a respective first and second distal ends of the sill and the header; and

a soft enclosure that includes:

at least one flexible, lightweight cover having an upper and lower sides coupled respectively with header and sill, and a first and a second lateral ends coupled with one of the respective first jamb and second jamb, and at least one stile.

A further exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the sill is coupled with a first structure.

Still a further exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the sill has a length that extends longitudinally along a length of the first structure with which the sill is associated.

Another exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the sill conforms to a contour of the first structure with which the sill is associated;

and the header is configured independent of the sill contour.

Yet another exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the header is curved, extending beyond the contour of the first structure.

Still another exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the stile has an axial length that varies longitudinally during an operation of the hybrid enclosure.

A further exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

while the stile articulates around the curved header at a top distal end of the stile, the stile is continuously and progressively contracted longitudinally along the axial length of the stile as the stile moves along a reciprocating path towards the first and second distal ends of the header and the sill, and is fully contracted at the first and second distal ends;

the stile is continuously and progressively extended longitudinally along the axial length of the stile as the stile moves along the reciprocating path towards an apex of the curved header, and is fully extended at the apex.

Still a further exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the sill has one of a straight, a curved, and a combination of straight and curved configuration.

Another exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the stile includes an extension element that moves longitudinally along the axial length of the stile to vary a reach of the stile in relation to the header and the sill as the stile moves along the reciprocating path, thereby varying the axial length of the stile to enable articulation of the stile along the curved header, and one of a straight, curved, and the combination of straight and curved configuration sill.

Yet another exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

stile includes a first housing at the top distal end of the stile, within which the extension element is housed and reciprocally moves to vary the axial length of the stile.

A further exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the extension element is coupled with an articulation mechanism that houses a set of rollers that ride along a track of the header, with the articulation mechanism rotating about a longitudinal axis of the extension element to enable the stile to articulate around the curved header.

Still a further exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

an angle between a longitudinal axis of the stile and a horizontal plane of the first structure varies, while the longitudinal axis of the stile remains substantially perpendicular to a longitudinal axis of the header and sill.

Another exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the longitudinal axis of the rigid stile is maintained substantially perpendicular in relation to the longitudinal axis of the sill by a L-shaped beam.

Yet another exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the L-shaped beam has an integral span section that is coupled with a sill track, and an integral support section substantially perpendicular the span section that is inserted within the stile.

A further exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the integral support section is housed within the stile at the bottom distal end of the stile, inserted along an axial length of the stile to maintain and support the weight of the stile; and

the axial length of the span section is oriented parallel the axial length of the sill, and coupled with the sill track by a connection module having a set of wheels that ride along the sill track.

Still a further exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the track of the header and the sill have a substantially circular cross-sectional profile that extends longitudinally along the length of the track and enables a set of concaved wheels to roll on the track and rotate about the axial length of the substantially circular track while moving transversally across the header and the sill, with a first concaved wheel and a second concaved wheel of the set of concaved wheels substantially oriented opposite, across the substantially circular track;

the track of the header and sill further include a second channel that extends longitudinally along the length of the track and enables a posturing mechanism to slide within the track while moving transversally across the header and the sill.

Another exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the wheels are comprised of a ride surface that is concaved with lateral projections that hug the header and sill track profile, thereby preventing the wheels from disengaging the track.

Still another exemplary optional aspect of the present invention provides a hybrid enclosure, further comprising:

a posturing mechanism associated with the flexible cover to provide proper posture for the flexible cover during operation.

Yet another exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the posturing mechanism includes:

horizontal reinforcement for horizontal posturing of the flexible cover;

lateral reinforcement elements for vertical posturing of the distal lateral ends of flexible cover.

A further exemplary optional aspect of the present invention provides a hybrid enclosure, wherein

the flexible cover is coupled with the header and sill by a set of vertical reinforcement elements positioned along a horizontal span of the flexible cover, which further aid in the vertical posturing of the entire flexible cover.

Still a further exemplary optional aspect of the present invention provides a hybrid enclosure, wherein:

the lateral reinforcement elements of the cover are detachably coupled with one of the first and second wall jamb and the stile.

Such stated advantages of the invention are only examples and should not be construed as limiting the present invention. These and other features, aspects, and advantages of the invention will be apparent to those skilled in the art from the following detailed description of preferred non-limiting exemplary embodiments, taken together with the drawings and the claims that follow.

BRIEF DESCRIPTION OF THE DRAWINGS

It is to be understood that the drawings are to be used for the purposes of exemplary illustration only and not as a definition of the limits of the invention. Throughout the disclosure, the word "exemplary" is used exclusively to mean "serving as an example, instance, or illustration." Any embodiment described as "exemplary" is not necessarily to be construed as preferred or advantageous over other embodiments.

Referring to the drawings in which like reference character(s) present corresponding part(s) throughout:

FIGS. **1**A-**1** to **1**E-**4** are exemplary illustrations of various views of a fully assembled hybrid enclosure system used in an exemplary shower area in accordance with the present invention;

FIG. **2** is an exemplary view that illustrates a disassembled, exploded view of the hybrid enclosure of FIGS. **1**A-**1** to **1**E-**4** with the separated parts to show the relationship and manner of assembly of the same in accordance with the present invention;

FIGS. **3**A to **3**C are exemplary illustrations of the various views of a first wall jam of the hybrid enclosure illustrated in FIG. **1**A-**1** to FIG. **2**, and close-up view of a part of the sill and a bracket in accordance with the present invention;

FIGS. **4**A to **4**D are exemplary illustrations of the various views of a second wall jam of the hybrid enclosure illustrated in FIG. **1**A-**1** to FIG. **3**C, and close-up view of a part of the sill, cover, and a bracket in accordance with the present invention;

FIGS. **5**A to **5**D are exemplary illustrations of the various views of the first and second stability brackets of the hybrid enclosure illustrated in FIG. **1**A-**1** to FIG. **4**D in accordance with the present invention;

FIGS. **6**A to **6**B are exemplary illustrations of the various views of the header of the hybrid enclosure illustrated in FIG. **1**A-**1** to FIG. **5**B in accordance with the present invention;

FIGS. **7**A to **7**I are exemplary illustrations of the various views of a top distal section of the stile of the hybrid enclosure illustrated in FIGS. **1**A-**1** to **6**B in accordance with the present invention;

FIGS. **8**A to **8**F are exemplary illustrations of the various views of a bottom distal section of the stile of the hybrid enclosure illustrated in FIGS. **1**A-**1** to **7**I in accordance with the present invention;

FIGS. **9**A to **9**I are exemplary illustration of horizontal and vertical reinforcement elements used as posturing mechanisms of the hybrid enclosure illustrated in FIGS. **1**A-**1** to **8**F in accordance with the present invention;

FIGS. **10**A to **10**H are exemplary illustrations of a method of installing the hybrid enclosure illustrated in FIGS. **1**A-**1** to **9**I of the present invention within a shower area in accordance with the present invention;

FIGS. **11**A to **11**C are exemplary illustrations of a hybrid enclosure used with in a corner-shower area in accordance with the present invention; and

FIG. **12** is an exemplary illustration of a hybrid enclosure used with in a corner-shower area using two stiles in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The detailed description set forth below in connection with the appended drawings is intended as a description of presently preferred embodiments of the invention and is not intended to represent the only forms in which the present invention may be constructed and or utilized.

Throughout the disclosure, references to a shower, shower enclosure, shower space, shower area, or hybrid shower enclosure are meant as illustrative of a preferred embodiment and for convenience of example, only. That is, the use of the hybrid enclosure of the present invention should not be limited to enclosing a shower, shower space, shower area, or as a mere shower enclosure, or a hybrid shower enclosure but may also be used to enclose or close-off a space or an area other than a shower, shower area, or shower space, non-limiting example of which may include dividing and closing off a section of a room.

The present invention provides a hybrid enclosure system that combines most of the beneficial features of the soft and rigid enclosures, but without their respective drawbacks. In addition, the hybrid enclosure system of the present invention increases the usable enclosed space when fully closed, and increases access to and from the enclosed space when fully open.

FIGS. **1**A-**1** to **1**E-**4** are exemplary illustrations of various views of a fully assembled hybrid enclosure system used in an exemplary shower area in accordance with the present invention. FIGS. **1**A-**1** to **1**E-**4** progressively illustrate the articulation of the hybrid enclosure of the present invention in various corresponding views from a closed position (FIGS. **1**A-**1** to **1**A-**7**) that closes-off ingress/egress to and from the shower area, to a fully open position (FIGS. **1**E-**1** to **1**E-**4**). Accordingly, FIGS. **1**A-**1** to **1**A-**7** are various views of the fully assembled hybrid enclosure **100** of the present invention in a fully closed position in accordance with the present invention. FIGS. **1**B-**1** to **1**B-**3** are various views of the fully assembled hybrid enclosure **100** of the present invention when the hybrid enclosure is about quarter of a way open. FIGS. **1**C-**1** to **1**C-**5** are various views of the fully assembled hybrid enclosure **100** of the present invention when the hybrid enclosure is halfway open. FIGS. **1**D-**1** to **1**D-**3** are various views of the fully assembled hybrid enclosure **100** of the present invention when the hybrid enclosure is three-quarters-way open, and FIGS. **1**E-**1** to **1**E-**4** are various views of the fully assembled hybrid enclosure **100** of the present invention when the hybrid enclosure is fully open.

In particular, FIGS. **1**A-**1**, **1**B-**1**, **1**C-**1**, **1**D-**1**, and **1**E-**1** are perspective front views of the fully assembled hybrid enclosure **100** used for enclosing the illustrated shower area in

accordance with the present invention. FIGS. **1**A-**1**, **1**B-**1**, **1**C-**1**, **1**D-**1**, and **1**E-**1** exemplarily illustrate from a perspective front view the progressive opening of the hybrid enclosure **100** from a fully closed position (FIG. **1**A-**1**) to a fully open position (FIG. **1**E-**1**) in relation to the entire shower area.

FIGS. **1**A-**2**, **1**B-**2**, **1**C-**2**, **1**D-**2**, and **1**E-**2** are top plan views of the fully assembled hybrid enclosure **100** of FIGS. **1**A-**1**, **1**B-**1**, **1**C-**1**, **1**D-**1**, and **1**E-**1**, and are used to exemplary illustrate the progressive opening of the hybrid enclosure **100** from the top plan views in the exact corresponding opening positions shown in the perspective front views of FIGS. **1**A-**1**, **1**B-**1**, **1**C-**1**, **1**D-**1**, and **1**E-**1**, from a fully closed position (FIG. **1**A-**2**) to a fully open position (FIG. **1**E-**2**).

FIGS. **1**A-**3**, **1**B-**3**, **1**C-**3**, **1**D-**3**, and **1**E-**3** are perspective views of the fully assembled hybrid enclosure **100**, and are used to exemplary illustrate the progressive opening of the hybrid enclosure **100** in the exact corresponding opening positions shown in the perspective front views of FIGS. **1**A-**1**, **1**B-**1**, **1**C-**1**, **1**D-**1**, and **1**E-**1**, from a fully closed position (FIG. **1**A-**3**) to a fully open position (FIG. **1**E-**3**).

FIGS. **1**A-**4**, **1**C-**4**, and **1**E-**4** are perspective rear views of the fully assembled hybrid enclosure **100**, and are used to exemplary illustrate the progressive opening of the hybrid enclosure **100** from the rear perspective views in the exact corresponding opening positions shown in the perspective front views of FIGS. **1**A-**1**, **1**C-**1**, and **1**E-**1**, from a fully closed position (FIG. **1**A-**4**) to a fully open position (FIG. **1**E-**4**).

As illustrated in FIGS. **1**A-**1** to **1**E-**4**, the present invention provides a hybrid enclosure system **100**, comprising a flexible, lightweight cover **101** coupled within a rigid frame **110** (that includes at least one rigid stile **120**) that functions to confine a space, with minimal structural encroachment into potential ingress and egress area of the space when fully open (FIGS. **1**E-**1** to **1**E-**4**).

As illustrated in FIGS. **1**A-**1** to **1**E-**4**, the hybrid shower enclosure **100** of the present invention is a combination of part soft enclosure and part rigid enclosure. That is, the present invention uses a flexible, lightweight soft cover (curtain-like) enclosure **101** in combination with a rigid frame **110** (with a rigid stile **120**) to close off access to an area when in fully closed position. The hybrid enclosure **100** of the present invention provides the benefit of a rigid shower enclosure by fully confining the water within the shower space, making it difficult for the water to drip out of the shower area. The hybrid shower enclosure of the present invention provides a rigid frame **110** (with a rigid stile **120**) and other rigid closing features to maintain water within the confines of the shower area, but without the drawbacks associated with conventional rigid enclosures. In addition, the hybrid enclosure of the present invention provides has minimal structural encroachment into potential ingress and egress access area of the shower space when fully open.

The hybrid enclosure **100** of the present invention provides the rigid stile **120** that is coupled with the flexible, lightweight cover **101** that when pulled (via the stile **120** handles **122**) at a closing direction (FIGS. **1**A-**1** to **1**A-**7**), the soft enclosure cover **101** is pulled to expand and fully extend the flexible, lightweight cover **101** to substantially close-off the space, confining the water within the shower space. It should be noted that the flexible, lightweight cover **101** is coupled with the rigid frame **110** via vertical reinforcement elements **138** and **140**, and laterally with the rigid stile **120** from within the enclosed area (e.g., shower area) rather than outside thereof, which facilitates maintaining water confined therein the enclosed space in both the opening and closing process of the hybrid enclosure **100**. Therefore, the flexible cover **101** has no part that is outside of the shower area from which water may drip or roll down (no droplets) to a position outside the shower area. Accordingly, whether the hybrid enclosure **100** is open, closed, or moving in a direction to either open or close access to an area, all parts of the flexible cover **101** always remain well within the confines of the area, thereby preventing any water droplets from falling outside the shower area. In addition, as best illustrated in FIGS. **1**A-**4**, **1**A-**5**, and **1**A-**6**, when fully closed, the entire length **131** of the stile **120** of the hybrid enclosure **100** physically contacts the entire length **147** of the first wall jamb **116** to substantially block water from dripping out of the shower area.

When the rigid stile **120** is pulled (via the handle **122**) to an opening direction (FIGS. **1**E-**1** to **1**E-**4**), the stile **120** pushes the flexible, lightweight cover **101** to fully open an ingress and egress access span (**127**) of the shower space with minimal structural encroachment, which as a length **129**. In general, when in the fully open position (FIGS. **1**E-**1** to **1**E-**4**), the hybrid shower enclosure of the present invention enables access with a span length **127** to the shower area that is almost equal to the total length **131** of the tub **124** (or basin **108**) without much encroachment (minus the span length **129** for the volume of space taken by the stile **120** and the gathered cover **101**). It should be noted that the length of the tub (basin) **131** parallels the width **119** (FIG. **1**A-**4**) of the hybrid enclosure **100**. This is particularly critical in smaller length applications where the total length **131** of the tub **124** is less than 32 inches. For example, with conventional in-line enclosures, more than half of the 32-inch access would be blocked due to structural overlap features, leaving less than 16-inchs for ingress/egress access to the shower area. Conventional pivot doors may be used instead, but the door for the conventional pivot doors rotate out from the closed position, most commonly outward and away from the shower space and toward the inside of room, which may also be very limited and minimal (e.g., a small apartment bathroom or an RV). The present invention provides a hybrid enclosure **100** without the conventional overlap feature that encroach to reduce the ingress/egress access area of the shower space, and can be used with both straight or curved shower tubs **124**, pans, or substrates **108**.

It should be noted that the hybrid shower enclosure **100** of the present invention may easily replace most conventional pivot door applications where bathroom space is limited. When fully closed (FIGS. **1**A-**1** to **1**A-**7**) to close-off access to the shower area, the width **119** of the hybrid enclosure **100** of the present invention is equal to the total length **131** of the basin **108** for fully closing-off access and to prevent water leakage. However, when fully open (FIGS. **1**E-**1** to **1**E-**4**), the potential encroachment width **129** of the hybrid enclosure into ingress/egress access width **127** is very small, leaving almost all of the basin (or curb **128**) length **131** for accessing the shower space, enabling the hybrid enclosure to replace the use of conventional pivot door. Further, the flexible, lightweight cover **101** of the present invention has the added benefit in that it can be used in the industries where substantial weight reduction and increased fuel efficiency is desired, including, for example, in the Recreational Vehicle (RV) industry.

As illustrated in FIGS. **1**A-**1** to **1**E-**4** and stated above, the hybrid enclosure **100** of the present invention includes the flexible, lightweight cover **101** coupled within the rigid frame **110** and at least one rigid stile **101** that functions to confine a space, with minimal structural encroachment (span **129**) into potential ingress and egress area of the space when

fully open. The rigid frame **110** is comprised of a sill **114** and a header **112** with a first wall jamb **116** and a second wall jamb **118** coupled between the sill **114** and the header **112**. In addition, the hybrid enclosure **100** of the present invention includes the soft enclosure **101** with at least one flexible, lightweight cover having an upper end **111** and lower end **113** coupled respectively with header **112** and sill **114**, and a first and a second lateral ends **115** and **117** coupled with one of the respective first wall jamb and second wall jamb **116** and **118**, and at least one stile **120**.

As illustrated in FIGS. **1**A-**1** to **1**E-**4**, the frame **110** of the hybrid enclosure **100** encloses an exemplary shower area defined by a surround comprised of a back wall **102**, a first lateral wall **106**, and a second lateral wall **104**, including a shower tub **124** seated within a basin **108**. The first wall jamb **116** is vertically oriented and is coupled with the first lateral wall **106**, and the second wall jamb **118** is vertically oriented and is coupled with the second lateral wall **104**. The first and second distal ends **103** and **105** of the header **112** are coupled with the upper distal ends of the respective first and second wall jambs **116** and **118** via a set of respective brackets **126**A and **126**B, and the first and second distal ends **107** and **109** of the sill **114** are coupled with the lower distal ends of the respective first and second wall jambs **116** and **118**. The stile **120** of the frame **110** is an elongated unit with a top distal end section **135** that adjustably couples with the header **112** through a top articulation mechanism **134**, and a bottom distal end section **137** that adjustably couples with the sill **114** though a bottom articulation mechanism **136**. The stile **120** has an axial length **121** (FIG. **1**C-**3**) that may optionally vary longitudinally during an operation of the hybrid enclosure **100** with the aid of the top and bottom articulation mechanisms **134** and **136**.

The sill **114** of the frame **110** is coupled with a first structure (in this exemplary instance, a curb **128** of the tub **124**). The sill **114** may be coupled with the curb of a shower pan (where there is no tub) or any substrate. In other words, the first structure may be the basin, tub, substrate, or foundation or ground of a space to be enclosed. The sill **114** has a length **119** that extends longitudinally along a length **131** of the first structure (e.g., curb **128**) while conforming to a contour of the first structure. In general, the length **119** (FIG. **1**A-**4**) of the sill **114** must be sufficient to fully cover the full length **131** of the first structure to prevent water leakage. The height of the sill **114** can be at any reasonable elevation. Although the sill **114** conforms to a contour of the first structure with which the sill **114** is associated, the header **112** is configured independent of the sill **114** contour. In other words, the header **112** and the sill **114** are fully independent of one another in terms of their respective shapes. That is, the sill **114** may take on any reasonable configuration independent of the header configuration. Therefore, the sill **114** may have a straight or a curved configuration to accommodate the configuration of the first structure with which the sill **114** is associated. The present invention provides sufficient flexibility in terms of maneuverability of the stile **120** with respect to its coupling with the sill **114** and the header **112** that it can accommodate different configurations of the sill **114** and header **112** (more details provided below). Accordingly, the header **112** may be of one configuration (shape) and the sill **114** of another shape, different from the shape of the header **112**.

As further illustrated in FIGS. **1**A-**1** to **1**E-**4**, the frame **110** further includes the header **112** that may optionally be curved rather than straight, with the curved section optionally extending beyond the first structure. This optional feature of extending the curvature of the header **112** beyond the contour (e.g., curb **128**) of the first structure (e.g., tub **124**) increases the usable shower area or interior volume of the shower space, providing a substantially syncline shower space profile (FIG. **1**A-**7**). The distance (indicated by the reference arrow **125**) by which an apex **123** of the curved header **112** is optionally extended beyond the first structure (e.g., curb **128**) to increase the interior volume of the shower space is only limited by the distance by which header **112** is permitted to encroach the space of the rest of the bathroom. That is, it is preferred that the interior shower space be balanced with the total bathroom space when selecting the radius of the curvature of the header **112** to be extended beyond the first structure. Of course, the greater the extension of the apex **123** of the curved header **112**, the greater the volume or space within the shower area. As best illustrated in FIGS. **1**A-**2**, **1**A-**7**, and **1**E-**1**, the interior shower space has a width **132**, which is the usable width of the tub **124** (where an individual may stand and take a shower). In a conventional shower area, this width **132** would be constant along the vertical length of the entire shower space. However, the curved header **112** of the present invention enables the upper section of the interior shower space to have a width **130** that is longer than the width span **132** of the tub **124**, thereby increasing the volume of the shower area by the distance **125**. Accordingly, the present invention provides a hybrid enclosure system **100** that combines all the beneficial features of the soft and rigid enclosures, but without their respective drawbacks. In addition, the hybrid enclosure system **100** of the present invention increases the usable enclosed space when fully closed, and increases access to and from the enclosed space when fully open.

As stated above, the hybrid enclosure **100** of the present invention provides the rigid stile **120**, which has the axial length **121** that optionally varies along the longitudinal axis **139** of the stile **120** during the operation of the hybrid enclosure **100**, when, for example, the header **112** used is curved out beyond the shower space. In other words, the axial length **121** of the rigid stile **120** may be optionally varied in accordance with the present invention if the longitudinal axis **141** of the header **112** and the longitudinal axis **143** of the sill **114** do not coincide (or exist) within same vertical plane. Stated other wise, if a vertical plane passing through the longitudinal axis **141** of the header **112** is the same as the vertical plane passing through the longitudinal axis **143** of the sill **114**, then the axial length **121** of the stile **120** along is longitudinal axis **139** need not vary. That is, if a header is used wherein any section of the header **112** does not substantially vertically coincide or align with a corresponding section of the sill **114** below the header **112**, then the axial length **121** of the stile **120** may be optionally implemented to vary along its longitudinal axis **139** in accordance with the present invention to enable proper opening and closing of the hybrid enclosure **100**. It should be noted that although a curved header **112** is illustrated that is extended beyond the shower space, other configurations are contemplated. In other words, the axial length **121** of the rigid stile **120** of the present invention may be optionally varied along its longitudinal axis **139** to enable continuous operation of the shower enclosure when the header **112** and the sill **112** are off from their respective vertical alignment or plane (intentionally to increase shower space or otherwise by design).

As cumulatively illustrated in FIGS. **1**A-**1** to **1**E-**4**, in the instance where an exemplary curved header **112** is used (with the curvature of the header **112** extending beyond the curb **128**), the stile **120** is continuously and progressively contracted longitudinally along its axial length **121** as it

moves along a reciprocating path towards the first and second distal ends **103** and **105** of the curved header **112** and the first and second distal ends **107** and **109** of the sill **114**. That is, while the stile **120** articulates around the curved header **112** at a top distal end section **135** of the stile **120**, the axial length **121** of the stile **120** is continuously and progressively contracted along its longitudinal axis **139** as the stile **120** moves along a reciprocating path towards the first and second distal ends **103** and **105** of the header **112** and the first and second distal ends **107** and **109** of the sill **114**. The axial length **121** of the stile **120** is fully contracted along its longitudinal axis **139** at the first and second distal ends **103** and **105** of the header **112** and the first and second distal ends **107** and **109** of the sill **114**.

As best illustrated in FIGS. **1**C-**1** to **1**C-**5**, the axial length **121** of the stile **120** is continuously and progressively extended along its longitudinal axis **139** as the stile **120** moves along the reciprocating path towards the apex **123** of the curved header **112**, and is fully extended at the apex **123**. That is, the axial length **121** of the stile **120** is fully extended at the apex **123** (where it is fully extended beyond the traditionally defined curb **128**, by the distance indicated by the reference number **125** in FIG. **1**A-**7**), while the stile **120** articulates around the curved header **112** at a top distal end section **135** and the sill **114** at a bottom distal end section **137**. Accordingly, the axial length **121** of the stile **120** progressively grows along its longitudinal axis **139** at the center (or apex **123**) of the header **123**, and progressively shrinks longitudinally at the end of the closing or opening process, while articulating around the curved header **112**, and a straight sill **114**. Describing the articulation of the stile **120** from another view point, during articulation of the stile **120** along the header/sill track, an angle β (FIG. **1**C-**5**) between the longitudinal axis **139** of the stile **120** and a horizontal plane **145** of the first structure varies, while the longitudinal axis **139** of the stile **120** remains substantially perpendicular (at angle Ω, shown in FIG. **1**C-**4**) to both the longitudinal axis **141** of the header **112** and the longitudinal axis **143** of the sill **114**. Of course, the longitudinal growth and contraction of the axial length **121** of the stile **120** along its longitudinal axis **139** will have different progression from those illustrated if the stile **120** articulates along different reciprocating paths defined by a header and sill (with different shapes). For example, both the header and the sill may have axial lengths that extends in an "S" configurations or, alternatively, the header may be as illustrated, but the sill have an "S" shape. Such variations are contemplated, and will affect the stile articulations in all aspects, including longitudinal expansion/contraction.

FIG. **2** illustrates a disassembled, exploded view of the hybrid enclosure of FIGS. **1**A-**1** to **1**E-**4** with the separated parts to show the relationship and manner of assembly of the same in accordance with the present invention. As illustrated, the hybrid enclosure **100** of the present invention is comprised of the flexible, lightweight cover **101** coupled within the rigid frame **110**. The frame **110** is comprised of the sill **114** and the header **112** with a first wall jamb **116** and a second wall jamb **118** coupled between the sill **114** and the header **112**. In addition, the hybrid enclosure **100** of the present invention includes the soft enclosure **101** with at least one flexible, lightweight cover having an upper end **111** coupled with the header **112** through vertical reinforcement elements **138**, and lower end **113** coupled with the sill **114** through vertical reinforcement elements **140**. The cover further includes a first and a second lateral ends **115** and **117** coupled with one of the respective first wall jamb and second wall jamb **116** and **118**, and at least one stile **120**.

As illustrated in FIG. **2**, the first wall jamb **116** is vertically oriented and is coupled with the first lateral wall **106** by fasteners **201**, and the second wall jamb **118** is vertically oriented and is coupled with the second lateral wall **104** by fasteners **206**. The first and second distal ends **103** and **105** of the header **112** are coupled with the upper distal ends of the respective first and second wall jambs **116** and **118** via a set of respective brackets **126**A and **126**B, and the first and second distal ends **107** and **109** of the sill **114** are coupled with the lower distal ends of the respective first and second wall jambs **116** and **118**. The stile **120** of the frame **110** has a top distal end section **135** that adjustably couples with the header **112** through a top articulation mechanism **134**, and a bottom distal end section **137** that adjustably couples with the sill **114** though a bottom articulation mechanism **136**. The stile **120** further accommodates a first magnetic strip **204** that mates with a second magnetic strip **202**, which is accommodated by the first wall jamb **116** to close-off access to and from shower area (best illustrated in FIGS. **1**A-**5** and **1**A-**6**).

FIGS. **3**A to **3**C are exemplary illustrations of the various views of a first wall jam of the hybrid enclosure illustrated in FIG. **1**A-**1** to FIG. **2**, and close-up view of a part of the sill in accordance with the present invention. As illustrated, the first wall jamb **116** is in general a single piece, integral unit that is preferably linear that includes a set apertures **314** aligned along its longitudinal axis that allow the first wall jamb **116** to securely couple with the first lateral wall **106**. The first wall jamb also includes a groove **312** that accommodates the second magnetic strip **202** (which is used to contact the first magnetic strip **204** accommodated by the stile **120**). The upper most aperture **314** (illustrated in FIG. **3**C) of the upper distal end **302** of the first wall jamb **116** is aligned with a corresponding aperture **418** on an extension portion **416** (shown in FIGS. **4**A and **5**A-**5**B) of the first bracket **126**A, both of which are then coupled with the first lateral wall **106** by the set of fasteners **201**.

The first bracket **126**A accommodates the first distal end **103** of the header **112** within its the inner section **324**, with the header **112** secured thereto though the apertures **322** by a set of fasteners **618** (FIG. **6**A). The first bracket **126**A is itself is also coupled to the first wall **106** through the aperture **320** by a fastener. The first bracket **126**A provides structural integrity in terms of added strength for the header **112**, for example, preventing it from rotating along its longitudinal axis **141**.

The first wall jamb **116** further includes a lower distal end **304** that couples with the first distal end **107** of the sill **114**. As further illustrated, the sill **114** includes dual tracks **306** and **308**, enabling the respective bottom articulation mechanism **136** of the stile **120** and the vertical reinforcement elements **140** to move along the sill **114**. The respective upper and lower channels **310**A and **310**B provide a space within which the rollers **712** of the bottom articulation mechanism **136** of the stile **120** to articulate.

FIGS. **4**A to **4**D are exemplary illustrations of the various views of a second wall jam of the hybrid enclosure illustrated in FIG. **1**A-**1** to FIG. **3**C, and close-up view of a part of the sill in accordance with the present invention. FIGS. **4**A and **4**B are exemplary illustrations of the upper distal end **402** of the second wall jam **118** of the hybrid enclosure **100**, and FIGS. **4**C and **4**D are exemplary illustrations of the lower distal end **404** the second wall jam **118** of the hybrid enclosure **100**. As illustrated, the second wall jamb **118** is in general a single piece, integral unit that is preferably linear that includes a set apertures **414** aligned along its longitudinal axis that allow the second wall jamb **118** to securely

couple with the second lateral wall **104**. The second wall jamb **118** also includes a groove **406** that accommodates an interlock section **408** of the first lateral end **115** of cover **101** to secure the cover **101** with the second wall jamb **118**. The interlock section **408** of the first lateral end **115** of the cover **101** is commensurately formed in relation to the groove **406**, with both the interlock section **408** and the groove **406** extending longitudinally along the axial lengths of the respective first lateral end **115** and the second wall jamb **118**. As further illustrated, the upper most aperture **414** (illustrated in FIG. **4**B) of the upper distal end **402** of the second wall jamb **118** is aligned with a corresponding aperture **418** on an extension portion **416** (shown in FIGS. **4**A and **5**A-**5**B) of the second bracket **126**B, both of which are then coupled with the second lateral wall **104** by the set of fasteners **206**.

The second bracket **126**B accommodates the second distal end **105** of the header **112** within its the inner section **324**, with the header **112** secured thereto though the apertures **322** by a set of fasteners **618** (FIG. **6**A). The second bracket **126**B is itself is also coupled to the second wall **104** through the aperture **320** by a fastener **206**. The second bracket **126**B provides structural integrity in terms of added strength for the header **112**, for example, preventing it from rotating along its longitudinal axis **141**. The second wall jamb **118** further includes a lower distal end **404** that couples with the second distal end **109** of the sill **114**. It should be noted that neither the sill **114** nor the second bracket **126**B cover or overlap the groove **406**, enabling easy replacement of the cover **101** after fully installation, assembly, and use.

FIGS. **5**A to **5**D are exemplary illustrations of the various views of the first and second brackets **126**A and **126**B of the hybrid enclosure illustrated in FIG. **1**A-**1** to FIG. **4**D in accordance with the present invention. As illustrated, both brackets **126**A and **126**B are mirror image components and described above, with the outer section **502** designed to have an aesthetic association with the header **112**. In general, a conventional straight or inline header connected at distal ends with conventional wall jambs at a straight line, provides great stability. That is, under heavy load conditions (e.g., when a person holds onto the header with one hand), it is preferred if the header withstands the vertical force of the weight of the pull of the person holding and pulling down on the header, with the vertical force being perpendicular (vertically orientation) to the axial length of the header. These vertical forces can cause vertical shearing forces perpendicular to the axial length of the header. In general, the vertical shearing force is at or near where the actual load is experienced by the header, which is generally at the distal ends of the header for a straight or inline header, which are above the first and second wall jambs, with the wall jambs functioning as "pillars" or "support columns" holding up the header ("the beam"). However, with curved headers, in addition to the actual load (vertical force) experienced by the header at its distal ends, additional torque is also experienced that can cause rotation or twisting. That is, since the apex of the curved header is out of line and not in-line with the distal ends, when a force is applied, a torque (e.g., rotation or twisting) is also experienced at the distal ends of the header, with the rotational force (or torque) about the inline axis of the distal ends of the header, which are also known as bending moments. That is, a simple, well-known, textbook definition of a torque is that it is a measure of how much a force (e.g., a user pulling down on the header) acting on an object (e.g., the header) causes that object (e.g., the header) to rotate. The mount by which the torque is increased is related to the distance of the apex of the header from the straight, inline axis between the distal ends of the header. This distance functions as the moment arm of the torque. Accordingly, the set of stability brackets **126**A and **126**B of the present invention are provided to add stability to the header, preventing the header from twisting about its axial length and provide a more secure attachment of the header with the rest of the shower space structure, including the first and second jambs.

The stability brackets **126**A and **126**B may be made by a die-casted component that integrates with the cross-sectional (or profile) contour of the distal ends of the header, and include an integrated extension tab that is placed behind and is attached to a preset cavity in the first and second jambs. The stability brackets interlock the header with one of the first and second jambs for a more secure and stable header installation. That is, the extension tab **416** of the set of stability header brackets is attached to the first and second jambs, with the extension tab **416** integral with the stability header bracket. The added stability is critical and needed when the header curves out of its virtual straight line (or inline) connection between the connection points with the first and second jamb, at the distal ends of the header. Accordingly, the combination of the form of the bracket commensurate with the profile form of the distal ends of the header and the integration of the tab of the bracket with the first and the second jambs will counter the torque and vertical shearing forces, providing great stability.

FIGS. **6**A to **6**B are exemplary illustrations of the various views of the header of the hybrid enclosure illustrated in FIG. **1**A-**1** to FIG. **5**B in accordance with the present invention. As illustrated, the header **112** includes dual tracks **602** and **610**, enabling the respective top articulation mechanism **134** of the stile **120** and the upper cover coupling vertical reinforcement elements **138** to move along the header **112**. The respective upper and lower channels **604**A and **604**B of provide adequate space within which the rollers **712** of the top articulation mechanism **134** of the stile **120** to articulate. As illustrated, the first track **602** of the header **112** is coupled with the track support **602** via a support flange **608**, forming two substantially equal upper and lower channels **604**A and **604**B. The first track **602** has a substantially circular cross-sectional profile that extends along the longitudinal axis **141** of the header **112**, which enables a set of concaved wheels **712** to roll on the first track **602** and rotate about the central longitudinal axis of the substantially circular track **602** while moving transversally across the header **112**. As further illustrated, the entire header **112** has an outer shell support **616** that provides further structural integrity in terms of added strength to the header **112** and an aesthetically pleasing look. The second track **610** of the dual track system of the header **112** include a substantially rectangular cross-sectional profile (with flanges or lips **612** and **614**) that define the second track **610**, and which extend longitudinally along the longitudinal axis **141** the header. The second track **610** enables a set of vertical reinforcement elements **138** to slide within the track **610** while moving transversally across the header and the sill.

FIGS. **7**A to **8**F are exemplary illustrations of the various view of the stile of the hybrid enclosure illustrated in FIGS. **1**A-**1** to **6**B in accordance with the present invention. FIGS. **7**A to **7**I are exemplary illustrations of the various views of a top distal section of the stile, and FIGS. **8**A to **8**F are exemplary illustrations of the various views of a bottom distal section of the stile.

As illustrated in FIGS. **7**A to **8**F, the stile **120** is comprised of a first lateral groove or canal **702** that accommodates a second interlock end **704** of the second lateral end **117** of the cover **101**. The extended flange **706** of the first lateral groove

or canal **702** provides added support for proper, aesthetically pleasing posture of the cover **101** during all operational phases of the hybrid enclosure **100**. The second interlock end **704** extends longitudinally along the length of the second lateral end **117** of the cover **101**, and the first lateral groove or canal **702** extends along the longitudinal axis **139** along the entire axial length **121** of the stile **120**.

The stile **120** is further comprised of a second lateral groove or canal **703** that accommodates the first magnetic strip **204** that mates with the second magnetic strip **202** of the first wall jamb **116** to close-off access to and from shower area (best illustrated in FIGS. **1A-5** and **1A-6**). The first magnetic strip **204** extends longitudinally along the axial length **121** of the stile **120**, and the second lateral groove or canal **703** extends along the longitudinal axis **139** along the entire axial length **121** of the stile **120**.

As more specifically illustrated in FIGS. **7**A to **7**I, the stile **120** further includes the top distal end section **135** that adjustably couples with the header **112** through the top articulation mechanism **134**. As stated above, while the stile **120** articulates around the curved header **112** at the top distal end section **135** of the stile **120**, the axial length **121** of stile **120** is continuously and progressively contracted along its longitudinal axis **139** as the stile **120** moves along a reciprocating path (the longitudinal axis **141** of the header **112**) towards the first and second distal ends **103** and **105** of the header **112**, and is fully contracted at the first and second distal ends **103** and **105**. The axial length **121** of the stile **120** is continuously and progressively extended along its longitudinal axis **139** as the stile **120** moves along the reciprocating path towards the apex **123** of the curved header **112**, and is fully extended at the apex **123**. Accordingly, the axial length **121** of the stile **120** progressively grows at the center (or apex **123**) of the header **123**, and progressively shrinks at the ends **103** and **105** during the closing or opening process, while articulating around the curved header **112**, and a sill that may have a straight, linear configuration.

As illustrated in FIGS. **7**A to **7**I, the stile **120** of the present invention includes an extension element (or an axial pivot pin) **708** that moves longitudinally along the longitudinal axis **139** of the stile **120** to vary the reach of the stile **120** in relation to the header **112** and the sill **114** as the stile **120** moves along the reciprocating curved path (longitudinal axis **141**) of the header **112**, thereby varying the axial length **121** of the stile **120** to enable articulation of the stile **120** along the curved header **112**, and one of a straight and curved sill **114**. The curved header **112** (or non-vertical alignment of the axial length of the header in relation to the axial length of the sill) is an optional feature and therefore, all structure that accommodates for functionality of this optional feature is also optional, and this includes the extension element and others, which are further detailed below. Therefore, the vertical up/down feature and a yaw articulation of a set of upper rollers (more detailed below) that may accompany an optional non-aligned header-sill combination are also optional. In other words, these optional features are used to support a non-aligned header-sill combination feature, only. Therefore, whether a curved basin or straight basin is used, if the header and the sill have commensurate vertical alignment, these optional features would not be needed. For example, both the header and the sill may be straight or curved and vertically aligned on top of one another and therefore, there would not be any need for the vertical and yaw articulations of the stile connections in relation to the header and the sill.

As best illustrated in FIGS. **7**D and **7**E, the stile **120** includes the top distal end section **135** that adjustably couples with the header **112** through the top articulation mechanism **134**, which provides four types of articulations. The articulation mechanism **134** includes the pivoting axis pin **708** that enables the axial length **121** of the stile **120** to extend or contract along the longitudinal axis **139** of the stile **120**, enabling the vertical or longitudinal articulation **730** of the top articulation mechanism **134**. The pivoting axis pin **708** also pivots about the longitudinal axis **139** of the stile **120**, which enables the yaw articulation **732** of the top articulation mechanism **134**, and the roller **712** have concaved surfaces that rotate or pivot along reciprocating path **714** about the central longitudinal axis of the track **602**, enabling "pitch" articulations. Finally, the entire top articulation mechanism **134** has a horizontal or translational articulation **734** that moves along the axial length of the track **602**.

The pivoting axis pin **708** extends or contracts the axis length **121** of the stile **120** along the illustrated Z-axis (vertical, up-down), which is the illustrated longitudinal axis **730**, and also enables the entire articulation mechanism **134** (including the pivoting axis pin **708**) to rotate about the Z-axis, providing yaw articulation **732**. As further illustrated, in FIGS. **7**D and **7**E, the extension element **708** is coupled with an articulation housing **710** that accommodates the set of rollers **712** that ride along the track **602** of the header **112**, with the articulation housing **710** rotating (yaw articulation **732**) about the longitudinal axis **730** of the extension element **708** to enable the stile **120** to articulate around the curved header **112**. This yaw articulation **732** enables smooth, easy movement of the stile **120** along the entire track **602** of the header **112**.

The third articulation of the top articulation mechanism **134** is related to the pivoting motion **714** of the rollers in relation to the track **602**, which may be construed as the "pitch" articulation. This pitch articulation **714** enables an angle β between the longitudinal axis **139** of the stile **120** and a horizontal plane **145** of the first structure to vary, while the longitudinal axis **139** of the stile **120** remains substantially perpendicular to a longitudinal axis **141** and **143** of the header **112** and sill **114**. It should be noted that the wheels are comprised of a ride surface that is concaved with lateral projections that hug the header track **602**, thereby preventing the wheels from disconnecting from the tract **602**. Accordingly, the concaved rollers around the track profile maintain the stile on the track, and prevent it from disengaging the track.

As best illustrated in FIGS. **7**E and **7**F, the stile **120** may include a first compartment **736** at the top distal end section **135** of the stile **120**, within which is inserted a cartridge **738** (FIG. **7**F). The cartridge includes a guidance chamber **740** with a top hole **742** wherein the optional extension element **708** is inserted, housed, and reciprocally moves to vary the axial length **121** of the stile **120** and enables rotation. It should be noted that the stile **120** is a continuous extruded component. That is, it has an upper and a lower opening, forming a through hole inside the stile **120**. The upper opening is capped by a piece **701** that has the aperture **742** that enables the extension **708** to move and be guided.

As best illustrated in FIGS. **7**G to **7**I, the extension element **708** is coupled with an articulation housing **710** via an articulation hole **754** (FIG. **7**I), with the articulation housing **710** accommodating the set of rollers **712** that ride along the track **602** of the header **112**. The rollers **712** are coupled with the articulation housing by a corresponding set of attachments mechanisms **748** through a cover **746** that is fastened to the articulation housing **710** by a set of fasteners **750**. More particularly, the articulation mechanism **134**

includes the articulation housing **710** that is a plastic piece, aluminum front plate **746**, four wheels **712** with attachment mechanism **748** (e.g., four ball bearings **748**A, and four axel pins **748**B) on which the wheels ride. The axle pins **748**B are riveted inside the aluminum plate **746**, with two fasteners **750** securing the aluminum plate **746** itself to the plastic piece housing **710** within apertures **752**.

FIGS. **8**A to **8**F are exemplary illustrations of the various views of a bottom distal section of the stile of the hybrid enclosure in accordance with the present invention. As illustrated, the stile **120** of the frame **110** includes the bottom distal end section **137** that adjustably couples with the sill **114** though the bottom articulation mechanism **136**. As illustrated in FIGS. **8**A to **8**C, the sill **114** includes dual tracks **306** and **308**, enabling the respective bottom articulation mechanism **136** of the stile **120** and the lower cover coupling clips **140** to move along the sill **114**. The respective upper and lower channels **310**A and **310**B provide sufficient space within which the rollers **712** of the bottom articulation mechanism **136** of the stile **120** to articulate.

As illustrated, the first track **306** of the sill **114** is coupled with the track support **804** via a support flange **802**, forming the two substantially equal upper and lower channels **310**A and **310**B. The first track **306** has a substantially circular cross-sectional profile that extends along the longitudinal axis **143** of the sill **114**, which enables a set of concaved wheels **712** to roll on the first track **306** and rotate about the central longitudinal axis of the substantially circular track **306** while moving transversally across the sill **114**. As further illustrated, the entire sill **112** has an outer shell support **806** that provides further structural integrity in terms of added strength to the sill **114** and an aesthetically pleasing look. The second track **308** of the dual track system of the sill **114** include a substantially rectangular cross-sectional profile (with flanges or lips **810**A and **810**B) that define the second track **308**, and which extend longitudinally along the longitudinal axis **143** of the sill **114**. The second track **308** enables a set of vertical reinforcement elements **140** to slide within the track **308** while moving transversally across the sill **114**.

As with the rollers **712** of the top articulation mechanism **134**, the rollers **712** of the bottom articulation mechanism **136** provide pivoting motion **820** in relation to the track **306**, which may be construed as the "pitch" articulation. This pitch articulation **820** enables an angle β between a longitudinal axis **139** of the stile **120** and a horizontal plane **145** of the first structure to vary, while the longitudinal axis **139** of the stile **120** remains substantially perpendicular to a longitudinal axis **141** and **143** of the header **112** and sill **114**. It should be noted that the wheels are comprised of a ride surface that is concaved with lateral projections that hug the header track **306**, thereby preventing the wheels from disconnecting from the tract **306**. Accordingly, the concaved rollers around the track profile maintain the stile on the track, and prevent it from disengaging the track.

As further illustrated in FIGS. **8**C to **8**F, the bottom articulation mechanism **136** is comprised of a removable L-shaped beam, which facilitates maintaining the longitudinal axis **139** of the stile **120** substantially perpendicular in relation to the longitudinal axis **143** of the sill **114**. The L-shaped beam is a single piece unit with an integral span section **822** that is coupled with the sill **114**, and an integral support section **824** substantially perpendicular to the span section **822** that is inserted within a second compartment **826** of the stile **120**. The integral support section **824** is housed within the second compartment **826** of the stile **120** located at the bottom distal end section **137** of the stile **120**, inserted along the axial length of the second compartment **826** to maintain and support the weight of the stile **120**. The span section **822** is oriented parallel the longitudinal axis **143** of the sill **114**, and coupled with the sill **114** by a connection module **830** having the set of wheels **712** that are spread out. The separate connection module **830** enables the L-shaped beam to be assembled and coupled with the sill **114** in opposite orientations to enable the hybrid enclosure **100** to open and close in opposite directions to accommodate either left-handed or right-handed installation options. As best illustrated in FIG. **8**E, the separate connection module **830** substantially covers a side of the span section **822**, and is connected therewith the span **822** by a set of fasteners **842** and the rollers **712**, with roller attachments **840**.

It should be noted that the separation distance **832** between the two sets of roller wheels **712** (best illustrated in FIGS. **8**D and **8**F) is critical in preventing the stile **120** from in-plane movement when the stile **120** is operational. That is, the length of the span section (in particular the distance **832** between the wheels **712**) is of sufficient size so to eliminate in-plane, lateral wobbling of the stile **120** during opening and closing operations. That is, the longitudinal axis of the span section is of sufficient length that in-plane motion of the stile **120** in relation to sill **114** is substantially eliminated, thereby maintaining stability (e.g., substantial perpendicular rigidity) of the stile **120** in relation to the sill **114**. The longer length of the span section compensates to minimize the affects of variations in tolerances for the various parts. As importantly, by extending the length or distance **832** between the rollers that are on the span section, the moment arm L_2 (FIG. **8**F) is extended, which reduces the force F_2 exerted on the roller components. This, in turn, reduces the movement of the components (defined by their respect tolerance). As best illustrated in FIG. **8**F, when the handle **122** of the stile **120** is pulled in either directions **834** or **835**, the force F_1 of that pull is leveraged at the fulcrum or pivot point, and translated into a moment (or torque) M_2 on the span section **822** of the L-shaped beam. That is,

$$M_1=M_2$$

$$F_1L_1=F_2L_2$$

$$F_2=F_1L_1/L_2$$

with F_1 equaling the force used on the handle **822** to pull/push the stile **120** and L_1 equaling the distance from the location of the applied force to the fulcrum or pivot point. The span L_2 is the distance **832** between the wheels **712** on the span section **822**, and F_2 is the leveraged force **836** experience by the beam. Accordingly, the longer the distance **832** (or the larger the value of L_2), the smaller the force **836**, providing greater stability by preventing in-plane movement of the stile **120** during its operation.

It should be noted that the present invention should not be limited to the first and second compartments **736** and **826** at the respective top and bottom distal end sections **135** and **137** of the stile **120**. That is, the first compartment **736** with its accommodating top articulation mechanism **134** may be located at the bottom distal end section **137** of the stile **120** and the second compartment **826** with its accommodating bottom articulation mechanism **136** located at the top distal end section **135**. That is, the first compartment **736** moved to the bottom distal end section **137** of the stile **120** can house the articulation mechanism **134** and all its accompanying components coupled with the sill **112**, and with the second compartment **826** moved to the top distal end section **135** of the stile **120** with the L-shaped beam coupled with the header **112**.

As a further note regarding the wheels or rollers **712**, the track **602** of the header **112** and track **306** of the sill **114** have a substantially circular cross-sectional profile that extends longitudinally along the length of the track and enable the set of concaved rollers **712** to slide on the tracks and rotate radially about the central axial length of the circular tracks while moving transversally across the header and the sill. That is, the wheels **712** are comprised of a ride surface that is concaved with lateral projections that hug the header and sill track profile. The benefit for using concaved wheels is that it enables the wheels to rotate about the axial length of the track sill/header, enabling the stile to move transversally across the header and the sill while maintaining the normal orientation of stile top and bottom distal end with the header/sill. This provides an independent movement of the top distal end section **135** of the stile **120** in relation to the header **112** verse the movement of the bottom distal end section **137** of the stile **120** in relation to the sill **114**. Therefore, the wheels riding on the round feature on the track sill/header allow for the rotation of the stile to move beyond the shower space. The same type of wheels is used on both the top and bottom distal end sections **135** and **137** of the stile **120**. In addition to facilitating improved articulation, the concaved ride surface of the wheels **712** also provides an anti-jump feature. That is, the concaved rollers with lateral projections that hug the header and sill track profile maintain the stile **120** on the tracks, and prevent it from disengagement. In other words, the lateral projections of the wheels is larger than the outside diameter of the track profile, thereby trapping in within the profile and maintaining smooth operation of the stile.

The present invention further provides a substantially inconspicuous posturing mechanisms associated with the flexible cover **101** to provide proper posture for the flexible cover **101** during operation, confine the flexible cover **101** within the shower area to prevent water leakage, and to provide a look that is esthetically pleasing. The posturing mechanisms include a set of horizontal reinforcement elements **220** and **222** for horizontal posturing of the flexible cover **101** along the upper and lower side **111** and **113**, a set of lateral reinforcement elements **224** and **226** for vertical posturing along the respective lateral ends **115** and **117** of the cover **101**, and a set of vertical reinforcement elements **138** and **140** for further vertical posturing of the flexible cover **101**. In general, the vertical reinforcement elements **138** and **140** are comprised of interlock-guide mechanism **138** and **140** (detailed further below). Therefore, the flexible cover **101** is coupled with the header **112** and sill **114** by a set of vertical reinforcement elements **138** and **140** positioned along a horizontal span of the flexible cover (upper and lower sides **111** and **113**), which further aid in the vertical posturing of the entire flexible cover. Non-limiting examples of factors or elements for determining appropriate posture for the cover **101** may exemplarily include the cover folds or pleats when the hybrid enclosure **100** is open or the stretch level of the cover when the hybrid enclosure **100** is closed.

On its own, a stand-alone flexible cover **101** (shown in FIG. **2**) is generally loose (not stretched tight or stiff) and can deform easily, and does not maintain appropriate "posture" when coupled with the frame **110** (and the stile **120**). In addition, during operation of the hybrid enclosure **100**, as sections of the flexible cover collapse to open access to the shower area, the flexible cover generally does not fold (or pleat) appropriately to be esthetically pleasing and, more importantly, various sections of the flexible cover may end outside the shower area, causing water leakage. In order to control appropriate posture and folding, a plurality of individual, vertically oriented support slats may be used (incorporated within the plane of the flexible cover) to provide some level of stiffness to define pleats (or the number and manner of folds during operation of the shower enclosure). However, the addition of vertical slats would take away from the esthetic appearance of a clear, glass-like flexible covering. Accordingly, the hybrid enclosure **100** of the present invention includes the substantially inconspicuous posturing mechanisms associated with the flexible cover to provide proper posture for the flexible cover during operation. The flexible cover of the present invention is properly folded during operation of the hybrid shower enclosure, made to remain within the shower area to prevent water leakage, and looks esthetically pleasing during operation by the addition of the posturing mechanisms. The posturing mechanisms function to create the proper stiffness appropriately commensurate with thickness, length, and height of the flexible cover for proper and esthetically pleasing operation.

FIGS. **9**A to **9**I are exemplary illustration of horizontal and vertical reinforcement elements used as posturing mechanisms in accordance with the present invention. As best illustrated in FIGS. **9**A to **9**C, the posturing mechanisms include the horizontal reinforcement elements **220** and **222**, non-limiting exemplary forms of which may include transparent or translucent flexible, but firmer strips or bands of material that add reinforcement across a top and a bottom side **111** and **113** of the flexible cover **101**. FIGS. **9**A to **9**C illustrate the bottom side **113** of the cover **101** in relation to the sill **114**, with the top side **111** of the cover **101** in relation to the header **112** being identical (with the except of the vertical reinforcement elements, which is detailed below).

As illustrated in FIGS. **9**A to **9**C, the added horizontal reinforcement elements **220** and **222** provide some level of stiffness (or rigidity) across the top and the bottom **111** and **113** of the flexible cover **101**. In addition to the horizontal reinforcement elements **220** and **222**, the posturing mechanism further includes a set of lateral reinforcement elements **224** and **226** for vertical posturing of the cover **101** along the respective lateral ends **115** and **117** of the cover **101** (best illustrated in FIGS. **2**, **4**A, and **7**A). Finally, the posturing mechanisms of the present invention includes the vertical reinforcement elements **138** and **140** that function to detachably couple the horizontal reinforcement mechanisms **220** and **222** of the flexible cover **101** at predetermined locations and angle with the header **112** and the sill **114**, and to further facilitate control of the folding of the entire flexible cover **101** from the top and the bottom **111** and **113** by vertically stretching the flexible cover **101**.

The horizontal reinforcement elements **220** and **222** function to control the appropriate fold (or pleating) of the flexible cover during operation (the number and the manner of pleats), including retaining the flexible cover fully within the shower area and provide an overall esthetically pleasing look. Accordingly, the horizontal reinforcement elements **220** and **222** across the top and bottom **111** and **113** of the flexible cover **101** are used to control the number and manner of folds (or pleats) of the flexible cover **101** during operation of the hybrid shower enclosure as the sections of the flexible cover collapse to open access to the shower area, and retain the flexible cover **101** within the shower area. More specifically, the manner by which the flexible cover **101** folds is made uniform and within the shower area, with the number of folds proportional with the total longitudinal (or vertical) length of the flexible cover across the access area of the shower space. It should be noted that the a plurality of individual, vertically oriented firmer bands or strips may be used (incorporated within the plane of the

flexible cover) to define pleats (or the number and manner of folds) during operation of the shower enclosure, but just as the slats, the vertical bands or strips would take away from the esthetic "look-and-feel" of a soft, flexible, curtain-like covering.

In order to help achieve even a more appropriate and aesthetically pleasing folding or pleating effect during the operation of the hybrid shower enclosure and to assist the horizontal reinforcement elements **220** and **222**, the substantially inconspicuous posturing mechanism of the present invention also provides the vertical reinforcement elements **138** and **140** in the form of a non-limiting, exemplary interlock-guide mechanism that stretch and couple the flexible cover **101** with the header **112** and sill **114**. In particular, the loose, unsupported sections of the flexible cover **101** in between the interlock-guide mechanisms **138** and **140** simply "hang" and are pulled down or deviated away from a more appropriate, desirable, and aesthetically pleasing parallel relationship with the header **112**. The parallel relationship may be achieved by further stiffening the flexible cover, but that would interfere with smooth, easy operation of the hybrid shower enclosure. The addition of the vertical reinforcement elements **138** and **140** in the form of the exemplary interlock-guide mechanism illustrated in FIGS. **9**A to **9**I enables a vertical stretching action from both the top and bottom **111** and **113** of the cover **101** to provide some level of vertical stiffness to the flexible cover enabling its top and bottom edges **111** and **113** (that are the top and bottom horizontal reinforcement elements **220** and **222**) to remain substantially parallel and aligned with the header **112** and the sill **114**. In particular, the orientation or angle of the interlock-guide mechanism are such that the upper interlock-guide mechanism **138** are oriented or angled to pull upward the top horizontal reinforcement element **220** (and hence the top **111** of the flexible cover **101**). The lower interlock-guide mechanism **140** are oriented or angled to pull downward the bottom horizontal reinforcement element **222** (and hence the bottom **113** of the flexible cover **101**). Therefore, the pulling or urging action on opposite sides counters the weight of the flexible cover **101**, and vertically stretches the flexible cover to prevent the loose "hang" look, and facilitate correct posture by parallel alignment of the top periphery edge **111** of the flexible cover **101** with the header **112**, and the bottom periphery edge **113** with the sill **114**. In general, non-limiting, exemplary orientation or angle of the interlock-guide mechanisms **138** and **140** in relation to the header **112** and sill **114** are about 3 or 4 degrees.

Each of the vertical reinforcement elements **138** and **140** are comprised of first piece **818/723** and second piece **816/720**, with the flexible cover **100** having holes through which the first piece **818/723** is inserted to interlock with the second piece **816/720**, thereby coupling the flexible cover **100** with the vertical reinforcement element **138/140**. The first piece **818/723** that is inserted through the hole and interlocks with the second piece **816/720** secures and maintains the flexible cover **100** attach to the vertical reinforcement elements **138** and **140**. The flexible cover includes holes **907** at proper positions so to couple with the vertical reinforcement elements **138** and **140**. The second piece **816/720** may be called a shade guide because it guides the shade (or cover **101**) along its path, it is riding along the inside channel of the header and sill and it guides the path of the flexible cover itself. The first piece **818/723** may be called an internal locking piece (a T-shaped lock) that pass through a hole in the flexible cover (and the stiffener portion) and interface and lock into the shade guide, which is the piece that resides in the channel of the sill/header and slides within the channel along the path of the header and the sill. The T-shaped lock **902/912** is a quarter turn fastener that twists to interlock with the second piece (the shade guide). The T-shaped lock facilitates ease of replace-ability of the flexible cover **101**.

As best detailed in the illustrated FIGS. **9**A to **9**I, the vertical reinforcement elements **138** and **140** couple the cover **101** along its horizontal upper and lower sides **111** and **113** with the respective header **112** and sill **114** via holes **907**. The vertical reinforcement elements in the exemplary forms of the interlock-guides **140** (FIGS. **9**D to **9**F) and **138** (FIGS. **9**G to **9**I) are comprised of a first detachable respective piece **818** and **723** that interlocks with a second respective piece **816** and **720** by a respective extension **902** and **912** of the first piece **818/723** that is inserted within a respective interlock aperture **904** and **916** of the second piece **816/720**. The second piece **816** has a glide section **814** that enables the second piece **816** to glide on the flanges **810**A and **810**B of second track **308** of the sill **114**, and the second piece **720** has a glide section **722** that enables the second piece **720** to glide on the flanges **612** of the second track **610** of the header **112**. The respective final interlock sections **812** and **724** of the interlock-guide mechanisms **138** and **140** enable the respective second piece **816** and **720** to movably interlock with the second tracks **308** and **610** at an angle (best illustrated in FIGS. **7**D and **8**B), which would vertically stretch the cover **101** in opposite directions as described above.

As further illustrated, the interlock-guide mechanisms **138** and **140** are curved along the surfaces at which the respective first piece **818** and **723** joins the respective second piece **816** and **720**. That is, the respective surface **908** and **914** of the respective first piece **818** and **723** are convex in relation to the respective concaved surface **906** and **922** of the respective second piece **816** and **720**. The convex and concave relationship between the first and second pieces compels the cover **101** (which is interlocked in between, best shown in FIGS. **9**A to **9**C) to have a slight folding or pleat for a more aesthetically pleasing look. As further illustrated, the respective second piece **816** and **720** of interlock-guide mechanisms **138** and **140** includes a protruded rounded edge in the form of an extended lip **908** and **920**, which facilitate in better posturing of the cover **101**. In general, extended lip **908** of the interlock-guide mechanisms **138** is oriented or pointed "up" when coupled with the sill **114**, and the extended lip **920** of the stretch clip **140** is oriented or pointed "down" when coupled with the header **112**. A final distinction between the interlock-guide mechanisms **138** and **140** is that the interlock-guide mechanisms **138** for the sill **114** is larger in size than the interlock-guide mechanisms **140** used with the header **112**. One reason for this difference in size between the "upper" interlock-guide mechanisms **140** that are smaller and those of the lower interlock-guide mechanisms **138** that are larger is because the lower ones need to extend further into the shower area to enable the lower articulation mechanism **136** (i.e., the L-shaped beam) to pass between the cover and the sill **114**. The lower interlock-guides **140** are also wider in width because the extra width provides further structural integrity in terms of added strength to reduce in-plane horizontal twisting forces.

FIGS. **10**A to **10**H are exemplary illustrations of a method of installing the hybrid enclosure of the present invention within a shower area in accordance with the present invention. A non-limiting exemplary step for installing the hybrid enclosure **100** includes measuring the curb **128** of the first structure to determine the length of the sill **114** to be used therewith. In general, the length of the sill **114** used should

be less than the total length of the curb **128** by a sufficient distance to enable room for installation of the wall jambs (FIG. **10**C).

As illustrated in FIG. **10**A, installation further includes inserting the bottom articulation mechanism **136** onto the first sill track **306** of the sill **114**. As described above, the bottom articulation mechanism **136** is comprised of a steel backing **830**, and is separate from the L-shaped beam. The separate connection module **830** enables the L-shaped beam to be assembled and coupled with the sill **114** in opposite orientations to enable the hybrid enclosure **100** to open and close in opposite directions to accommodate either left-handed or right-handed installations. This way, the user has the option to install the hybrid enclosure to open the door to the right or to the left. Either way, the wheels are always within the shower area. The direction of opening, and hence, the orientation of the connection of the L-shaped beam in connection with the wheel module (the steel backing) depends on the floor plan of the bathroom. In general, the door is open in a direction that would allow free access to ingress/egress out of the shower area.

The next, a set of first vertical reinforcement elements (the lower vertical reinforcement elements **140**) are installed within the sill channel **308** of the sill **114**. As indicated above, the vertical reinforcement elements are in the non-limiting, exemplary from of stretch clips that serve as attachment mechanism for the flexible cover **101**. Thereafter, as best illustrated in FIG. **10**B, the sill **114** is coupled with the first structure. Again, the first structure may be the curb **128** of a tub (basin), the curb of a shower pan or substrate.

Prior to installing the remaining components of the hybrid enclosure **100**, a closing-side of the hybrid enclosure for closing-off access to shower space must be determined and, thereafter (as best illustrated in FIG. **10**C), commensurately, installing one of the first wall jamb **116** and the second wall jamb **118** on the closing-side, and installing another of the first wall jamb **116** and the second wall jamb **118**, opposite the closing side. The installation may be accomplished by a variety of mechanism, one non-limiting example of which may including slipping the wall jambs over the sill **114** and secure them by the use of fastener in non-limiting, exemplary from of one or more screws.

As best illustrated in FIG. **10**D, after installing the wall jambs, a set of stability brackets **126**A and **126**B at upper distal ends of the wall jambs **116** and **118** are installed. The upper most aperture of the upper distal end of the first and second wall jambs **116** and **118** are respectively aligned with a corresponding aperture **418** on an extension portion **416** of the first and second bracket **126**A and **126**B, both of which are then coupled by the set of fasteners **201**.

After installing the stability brackets **126**A and **126**B, the distance between the inside **324** of both brackets **126**A and **126**B is measured to determine the length of the header **112** to be used for installation and assembly of the hybrid enclosure. As best illustrated in FIG. **10**E, once the length of the header **112** is determined and cut accordingly, the second set of vertical reinforcement elements **138** are inserted within a header channel **602** of the header **112**, with the extended lip **920** oriented downward. Thereafter, the upper articulation mechanism **134** is inserted onto a header track **602** of the header **112**.

As best illustrated in FIG. **10**F, after installing the upper articulation mechanism **134**, the lower articulation mechanism **136** is first inserted into the bottom distal end section **137** of the stile **120**, the upper articulation mechanism **134** is then inserted into the top distal end section **135** of the stile **120**, and finally, the first and second distal ends **103** and **105** of the header **112** is engaged with the stability brackets **126**A and **126**B.

Finally, as illustrated in FIGS. **10**G and **10**H, the flexible cover **101** is coupled with the stile **120**, one of the first and second wall jambs, and the respective first and the second vertical reinforcement elements and of the sill **114** and the header **112**. The stile includes the channel **702** that extends longitudinally along the axial length of the stile **120** with a profile that receives a first periphery edge **226** of the flexible cover **101**. The one of the first and second wall jambs (in this non-limiting exemplary instance, second wall jamb **118**) also includes a channel **406** that extend longitudinally along the axial length of the wall jamb with a profile that receives a second periphery edge **408** of the flexible cover **101**. Thereafter, associating the bottom and top **111** and **113** of the flexible cover **101** with a first piece **816** and **720** of the respective first and second vertical reinforcement elements **138** and **140**. It should be noted that there is a pre-drilled hole on the top and bottom **111** and **113** of the flexible cover (through the stiffener also). The flexible cover **101** is engaged with the first piece **816** and **720** by inserting the first piece through these holes. Then, the second piece (the T-shaped interlock) **818**/**723** of the respective first and second vertical reinforcement is passed through the holes to engage with and interlock with the first piece **816**/**720**, securely mounting the flexible cover with the sill and the header. As a final step, the stile handle **122** is coupled with the stile **120** for assembly of the hybrid enclosure.

FIGS. **11**A to **11**C are exemplary illustrations of a hybrid enclosure used with in a corner-shower area in accordance with the present invention. The hybrid enclosure **1100** of FIGS. **11**A to **11**C includes similar corresponding or equivalent components, interconnections, and or cooperative relationships as the hybrid enclosure **100** that is shown in FIGS. **1**A-**1** to **10**H, and described above. Therefore, for the sake of brevity, clarity, convenience, and to avoid duplication, the general description of FIGS. **11**A to **11**C will not repeat every corresponding or equivalent component and or interconnections that has already been described above in relation to hybrid enclosure **100** that is shown in FIGS. **1**A-**1** to **10**H.

As illustrated in FIGS. **11**A to **11**C, the hybrid enclosure **1100** is comprised of a curved header **112** and a curved sill **1102**. In this particular instance, the axial length **121** of the stile **122** of the hybrid enclosure **1100** need not vary since the longitudinal axis **141** of the header **112** and the longitudinal axis **143** of the sill **1102** do coincide (or exist) within same vertical plane. Stated otherwise, since a vertical plane passing through the longitudinal axis **141** of the header **112** is the same as the vertical plane passing through the longitudinal axis **143** of the sill **1102**, then the axial length **121** of the stile **122** along is longitudinal axis **139** need not vary.

FIG. **12** is an exemplary illustration of a hybrid enclosure used with in a corner-shower area in accordance with the present invention. The hybrid enclosure **1200** of FIG. **12** includes similar corresponding or equivalent components, interconnections, and or cooperative relationships as the hybrid enclosure **100** and **1100** that are shown in FIGS. **1**A-**1** to **11**C, and described above. Therefore, for the sake of brevity, clarity, convenience, and to avoid duplication, the general description of FIG. **12** will not repeat every corresponding or equivalent component and or interconnections that has already been described above in relation to hybrid enclosure **100** and **1100** that are shown in FIGS. **1**A-**1** to **11**C.

As illustrated in FIG. **12**, the hybrid enclosure **1200** is comprised of two stiles **120**A and **120**B, rather the single stile **120** illustrated in FIGS. **1**A-**1** to **11**C. In this particular instance, ingress/egress into and from a shower area is accessed from the middle rather than one of the distal ends of the header/sill.

Although the invention has been described in considerable detail in language specific to structural features and or method acts, it is to be understood that the invention defined in the appended claims is not necessarily limited to the specific features or acts described. Rather, the specific features and acts are disclosed as preferred forms of implementing the claimed invention. Stated otherwise, it is to be understood that the phraseology and terminology employed herein, as well as the abstract, are for the purpose of description and should not be regarded as limiting. Therefore, while exemplary illustrative embodiments of the invention have been described, numerous variations and alternative embodiments will occur to those skilled in the art. Such variations and alternate embodiments are contemplated, and can be made without departing from the spirit and scope of the invention.

It should further be noted that throughout the entire disclosure, the labels such as left, right, front, back, top, bottom, forward, reverse, clockwise, counter clockwise, up, down, or other similar terms such as upper, lower, aft, fore, vertical, horizontal, oblique, proximal, distal, parallel, perpendicular, transverse, longitudinal, etc. have been used for convenience purposes only and are not intended to imply any particular fixed direction or orientation. Instead, they are used to reflect relative locations and/or directions/orientations between various portions of an object.

In addition, reference to "first," "second," "third," and etc. members throughout the disclosure (and in particular, claims) is not used to show a serial or numerical limitation but instead is used to distinguish or identify the various members of the group.

In addition, any element in a claim that does not explicitly state "means for" performing a specified function, or "step for" performing a specific function, is not to be interpreted as a "means" or "step" clause as specified in 35 U.S.C. Section 112, Paragraph 6. In particular, the use of "step of," "act of," "operation of," or "operational act of" in the claims herein is not intended to invoke the provisions of 35 U.S.C. 112, Paragraph 6.

What is claimed is:

1. A hybrid enclosure, comprising:

a cover coupled with a frame and at least one stile that functions to confine a space;

the stile has an axial length that varies longitudinally during operation;

the frame includes:

a sill;

a header;

a first jamb and a second jamb coupled between the sill and the header at a respective first and second distal ends of the sill and the header; and

wherein: the cover has an upper and lower sides coupled respectively with header and sill, and a first and a second lateral ends coupled with one of the respective first jamb or second jamb, and at least one stile;

the header is curved, extending beyond a contour of a first structure;

the stile includes an extension element that moves longitudinally along the axial length of the stile to vary a reach of the stile in relation to the header and the sill as the stile moves along a reciprocating path, thereby varying the axial length of the stile to enable articulation of the stile along the curved header, and one of a straight, curved, and the combination of straight and curved configuration sill;

the extension element is coupled with an articulation mechanism that houses a set of rollers that ride along a track of the header, with the articulation mechanism rotating about a longitudinal axis of the extension element to enable the stile to articulate around the curved header.

2. The hybrid enclosure as set forth in claim **1**, wherein:

the sill is coupled with a first structure.

3. The hybrid enclosure as set forth in claim **2**, wherein:

the sill has a length that extends longitudinally along a length of the first structure.

4. The hybrid enclosure as set forth in claim **2**, wherein:

the sill has a length that conforms to a contour length of the first structure;

and the header is configured independent of the sill contour length.

5. The hybrid enclosure as set forth in claim **1**, wherein:

while the stile articulates around the curved header at a top distal end of the stile, the stile is continuously and progressively contracted longitudinally along the axial length of the stile as the stile moves along a reciprocating path towards the first and second distal ends of the header and the sill, and is fully contracted at the first and second distal ends;

the stile is continuously and progressively extended longitudinally along the axial length of the stile as the stile moves along the reciprocating path towards an apex of the curved header, and is fully extended at the apex.

6. The hybrid enclosure as set forth in claim **1**, wherein:

the sill has one of a straight, a curved, and a combination of straight and curved configuration.

7. The hybrid enclosure as set forth in claim **1**, wherein:

the stile includes a first housing at the top distal end of the stile, within which the extension element is housed and reciprocally moves to vary the axial length of the stile.

8. The hybrid enclosure as set forth in claim **1**, wherein:

an angle between a longitudinal axis of the stile and a horizontal plane of the first structure varies, while the longitudinal axis of the stile remains substantially perpendicular to a longitudinal axis of the header and sill.

9. The hybrid enclosure as set forth in claim **8**, wherein:

the longitudinal axis of the stile is maintained substantially perpendicular in relation to the longitudinal axis of the sill by a L-shaped beam.

10. The hybrid enclosure as set forth in claim **9**, wherein:

the L-shaped beam has an integral span section that is coupled with a sill track, and an integral support section substantially perpendicular the span section that is coupled with the stile.

11. The hybrid enclosure as set forth in claim **10**, wherein:

the integral support section is housed within the stile at a bottom distal end of the stile, inserted along the axial length of the stile to maintain and support a weight of the stile; and

an axial length of the span section is oriented parallel the axial length of the sill, and coupled with the sill track by a connection module having a set of wheels that ride along the sill track.

12. The hybrid enclosure as set forth in claim **1**, further comprising:

a posturing mechanism associated with the cover to provide proper posture for the cover during operation.

13. The hybrid enclosure as set forth in claim 12, wherein:
the posturing mechanism includes:
horizontal reinforcement for horizontal posturing of the cover;
lateral reinforcement elements for vertical posturing of the distal lateral ends of cover.

14. The hybrid enclosure as set forth in claim 13, wherein
the cover is coupled with the header and sill by a set of vertical reinforcement elements positioned along a horizontal span of the cover, which aid in the vertical posturing of the entire cover.

15. The hybrid enclosure as set forth in claim 13, wherein:
the lateral reinforcement elements of the cover are detachably coupled with one of the first and second wall jamb and the stile.

16. A posturing mechanism for a cover, comprising:
first and second horizontal reinforcement elements that include horizontally oriented stiffeners that add reinforcement horizontally across upper and lower end of the cover;
integral first and second lateral reinforcement elements are comprised of interlock ends having cross-sectional profiles that extend longitudinally along a length of first and second lateral ends of the cover, and mate and interlock with a mating structure; and
vertical reinforcement elements that are associated with the first and second horizontal reinforcement elements at predetermined locations.

17. The posturing mechanism for a cover as set forth in claim 16, wherein:
the vertical reinforcement elements are comprised of guide mechanisms that maintain and hold the cover in a generally vertical orientation.

18. The posturing mechanism for a cover as set forth in claim 17, wherein:
guide mechanisms are oriented towards a first direction at a first angle to pull upward the first horizontal reinforcement element.

19. A stile, comprising:
an adjustable mechanism that includes:
adjustable members with translation, axial, and rotation motions to adjust stile position, extension, and orientation.

20. The stile as set forth in claim 19, wherein:
the adjustable mechanism is comprised of a top adjustment mechanism positioned at a top distal end of the stile and a bottom adjustment mechanism positioned at a bottom distal end of stile.

21. A stile, comprising:
adjustable members that provide for:
a translation that moves the stile along a reciprocating path;
an axial motion that varies during operation of the stile to longitudinally vary an axial length of the stile;
a rotational motion that varies an angular tilt between a longitudinal axis of the stile in relation to a horizontal plane.

22. A hybrid enclosure, comprising:
a cover coupled with a frame and at least one stile that functions to confine a space;
the stile has an axial length that varies longitudinally during operation;
the frame includes:
a sill;
a header;
a first jamb and a second jamb coupled between the sill and the header at a respective first and second distal ends of the sill and the header; and
wherein: the cover has an upper and lower sides coupled respectively with header and sill, and a first and a second lateral ends coupled with one of the respective first jamb or second jamb, and at least one stile;
a track of the sill has a substantially circular cross-sectional profile that extends longitudinally along a length of the track and enables a set of concaved wheels to roll on the track and rotate about an axial length of the substantially circular track while moving transversally across the sill, with a first concaved wheel and a second concaved wheel of the set of concaved wheels substantially oriented opposite, across the substantially circular track.

23. The hybrid enclosure as set forth in claim 22, wherein:
the wheels are comprised of a ride surface that is concaved with lateral projections that hug the sill track profile, thereby preventing the wheels from disengaging the track.

24. The hybrid enclosure as set forth in claim 22, wherein:
the track of the sill further include a second channel that extends longitudinally along the length of the track and enables a posturing mechanism to slide within the track while moving transversally across the sill.

25. A cover, comprising:
an upper end with a first set of holes;
a lower end with a second set of holes;
a first lateral end; and
a second lateral end;
the upper and lower ends further including respective first and second horizontal reinforcement elements comprised of horizontally oriented stiffeners that add reinforcement, horizontally across upper and lower end of the cover to provide horizontally spanning rounded pleading horizontally across the cover;
the first and second lateral ends further include respective integral first and second lateral reinforcement elements comprised of interlock ends having cross-sectional profiles that extend longitudinally along a length of first and second lateral ends of cover, and mate and interlock with a mating structure.

26. A stile, comprising:
an upper portion associated with a header
a lower portion associated with a sill; and
having a longitudinal axis that is maintained substantially perpendicular in relation to a longitudinal axis of the sill using an L-shaped beam associated with stile and sill;
a track of the sill has a substantially circular cross-sectional profile that extends longitudinally along a length of the track that enables a set of concave wheels to roll on the track and rotate about an axial length of the substantially circular track while in motion across the sill, with a first concaved wheel and a second concaved wheel of the set of concaved wheels substantially oriented opposite, across the substantially circular track.

27. A hybrid enclosure, comprising:
a cover coupled with a frame and at least one stile that functions to confine a space;
the stile has an axial length that varies longitudinally during operation;
the frame includes:
a sill;
a header;

a first jamb and a second jamb coupled between the sill and the header at a respective first and second distal ends of the sill and the header; and

wherein: the cover has an upper and lower sides coupled respectively with header and sill, and a first and a second lateral ends coupled with one of the respective first jamb or second jamb, and at least one stile;

the header is curved, extending beyond a contour of a first structure;

the stile includes an extension element that moves longitudinally along the axial length of the stile to vary a reach of the stile in relation to the header and the sill as the stile moves along a reciprocating path, thereby varying the axial length of the stile to enable articulation of the stile along the curved header, and one of a straight, curved, and the combination of straight and curved configuration sill;

an angle between a longitudinal axis of the stile and a horizontal plane of the first structure varies, while the longitudinal axis of the stile remains substantially perpendicular to a longitudinal axis of the header and sill;

the longitudinal axis of the stile is maintained substantially perpendicular in relation to the longitudinal axis of the sill by a L-shaped beam;

the L-shaped beam has an integral span section that is coupled with a sill track, and an integral support section substantially perpendicular the span section that is coupled with the stile;

the integral support section is housed within the stile at a bottom distal end of the stile, inserted along the axial length of the stile to maintain and support a weight of the stile; and

an axial length of the span section is oriented parallel the axial length of the sill, and coupled with the sill track by a connection module having a set of wheels that ride along the sill track.

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